THE

FARMER'S MAGAZINE:

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(No. L.)

BRANCH I.

ORIGINAL COMMUNICATIONS.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Uses of Moss as Manure to Land. By WILLIAM AITON, Strathaven. (Continued from No. XLIX, p. 36.)

SIR, *Strathaven, 20th May,* 1812.

HAVING in my last communication noticed, that moss-earth was capable of being formed into manure, by the operations of the weather, and by being mixed with lime, I shall now attend to other methods by which it has already been converted into efficient manure.

Of Moss formed into Manure by being fermented with Dung.

This is, of all others yet known, the most proper and effectual method of converting moss-earth into manure. When dung, in its most powerful stages of fermentation, is mixed with moss, the fermenting and putrefying qualities of the former are readily communicated to the latter, and bring on a degree of heat, which dissolves the acid in the moss, reduces its antiseptic qualities, and brings it into a state of putrefaction: which being once begun, continues, till it ultimately dissolves the organic texture of the moss, sets at liberty the vegetable matter and other substances of which it was composed, and reduces the whole compost to the food of plants.

Some persons had, many years ago, mixed moss with dung; but Lord Meadowbank was the first who investigated and ascertained, on scientific principles, the immense value of that spe-

cies of manure. That learned Judge, perceiving that moss was entirely composed of vegetable matter, which, but for the antiseptic quality which it had acquired, was as capable of becoming manure to the soil as any other vegetable matter, instituted an inquiry into what that quality was, and how it could be overcome. From his extensive chemical knowledge, and diligent researches into the nature and qualities of moss, he found, that its insolubility proceeded chiefly from a portion of the gallic, or some acid it contained, and from the astringent principle of tan: and as these are reduced, in fresh vegetables, by the hot fermentation to which they are subjected in the early stages of putrefaction, he concluded that the same process would produce similar effects on moss. And though the moss-earth was too inert, and its antiseptic quality too strong, to come spontaneously, like recent vegetables of a richer quality, under immediate putrefaction, yet his Lordship found nothing in moss, or in the partial decomposition or other changes it had undergone, that rendered it incapable of being prepared for manure.

After many experiments, during the course of six years, his Lordship found, that by mixing a quantity of fermenting dung with a certain proportion of moss-earth, in the form of a compost midden, the fermenting qualities of the dung, were communicated to the moss. Heat, sufficient to reduce the insolubility of the acid and tan, and to render the whole mass soluble, was raised; the fermenting acid and putrefying qualities of the dung were thereby communicated to the moss-earth, and the whole heap was thereby formed into valuable manure. Having made these important discoveries, and proved their utility by the test of experience, his Lordship, with his usual degree of patriotism and public spirit, communicated the results to the public in a pamphlet which he distributed *gratis*.

As that pamphlet has been often reprinted, and the substance of it given in your Magazine, it would be superfluous to copy it here: and I shall merely repeat the substance of his Lordship's directions for forming this species of manure. The moss to be used may be taken either from the top or bottom of the strata, as may be most convenient: only the turfy parts, his Lordship thinks, ought to be laid aside, and that which is fittest for fuel preferred. It ought to be thrown out from the pit for a few weeks, till it be divested of some part of its moisture; and I am humbly of opinion, that its being exposed to the weather, especially to frost, would be found beneficial in reducing its tenacity. After it is dried a little, it may be carried to the field to which it is to be applied, and mixed into a compost midden with the dung.

The quantity of materials to be used, his Lordship thinks, ought to be one ton dung to three tons moss. With submission

to his Lordship, however, I am humbly of opinion, that the proportion of the materials ought to be regulated by the state in which they are when mixed. If the moss used is taken from a patch of low meadow, formed by some spring, but occasionally overflooded with water from the cultivated lands, the moss will contain such a mixture of other earth as renders it brittle, inadhesive, and unfit for fuel; and in that case putrefaction will be much easier excited in such moss, than in that which has been formed in a more elevated situation, and is altogether free of extraneous matter. On the other hand, some species of dung are much more disposed to putrefaction than others. Horses' dung will more powerfully excite fermentation than that of cows: new dung will more readily ferment than that which is old and rotten: town dung will excite fermentation more powerfully than ordinary farm dung.

For these reasons, I would recommend the strictest attention to the quality of both the moss and dung, at the time they are put together. If the moss contains extraneous admixtures, or is much disposed to yield to putrefaction, and if the dung mixed with it be rich town dung, or that of horses in its most fermenting stages, at least three tons of moss may be mixed with every ton of such dung. But if the moss is of the most insoluble quality, free of extraneous admixture, and not long exposed to the weather, and ordinary farm-yard dung is used, it will be proper to apply at least two tons dung to every five tons of moss; and if cow dung only be used, I would recommend to mix it and the moss in equal proportions.

The first stratum ought to be moss, about six inches thick, succeeded by dung ten inches, moss six, dung four, and moss six inches, then a thin layer of dung, and the whole midden covered with moss: its height will thus be from four to five feet, the materials being put loosely together. The compost comes into a general heat, sooner or later after being mixed, according to the state of the weather, and that of the materials: in summer in ten days or so; but in winter not perhaps for several weeks. The compost ought to be attended to in this stage, and its heat ascertained. If it approaches to blood-heat, it ought either to be watered or turned over, and new moss mixed, to prevent injury by too much heat; and if it does not come into heat, the antiseptic quality of the moss will not be reduced.

After the heat has subsided, the midden ought to be completely overturned, upside down, and inside out, and the moss as much broken as possible; after which it comes a second time into a moderate degree of heat, for a few days; and whenever it cools it is ready for being applied to the ground as manure: but the longer it remains in the midden, the richer will it become. Compost made up in that manner, in January, his Lordship

observes, may be ready to be used as manure to the spring crops, and in summer it may be prepared in eight or ten weeks; but it would certainly be better to allow it more time in the state of fermentation in the midden. That which is made up in the month of February or March, may be ready for the turnip or wheat crops; but that which is to be used on the spring crops, ought to be composed during the preceding summer; and the moss should always be dug up and exposed to the frost for one winter, at least, before it is mixed with the dung. The fermentation would be greatly accelerated by an admixture of green herbage; as rushes, spritts, docks, thistles, ragweed, &c. cut before their seeds are ripened. Ashes, hotlime, lime rubbish, lime slacked in water, or any other matter that would accelerate putrefaction and decomposition in the moss, might be applied with advantage.

Both the powers and the duration of this species of manure, which had stood the test with Lord Meadowbank on a considerable extent of ground, and of much diversity of soil, and during the period of six years prior to the time he published the results, have since been found, on thousands of trials during the last ten years, fully to answer the end which his Lordship proposed; and produced returns no way inferior to the best farm-yard dung, given in equal quantity. His Lordship says, 'hitherto it has been found equal, and indeed preferable, 'to common farm-yard dung, for the first three years; and de-'cidedly to surpass it afterwards:' And thousands of farmers, who have made trial of this manure for a still longer period, have attested the fact stated by the learned Lord.

This is certainly one of the most interesting discoveries ever made in agriculture. To be able to multiply every ton of dung into four tons, from materials otherwise of no value, and which nine out of every ten farmers in Scotland can procure, within one, or at most two miles of their farms, and which three fourths of them can find in some corner of their own possessions, is a discovery of vast importance to the interest of agriculture, and that of the nation. Many farmers have shown a strong indifference about that valuable manure: and others have prepared it in such a careless manner, as in a great measure to defeat its beneficial effects. But if it were properly made up, and used by all farmers, to the greatest possible extent, it would in a few years greatly enrich the soil, and add one third to its produce.

It is true, that the late Dr Walker, has stated his doubts of the possibility of bringing moss into a state of putrefaction. He says, 'When a vegetable substance has passed through the vi-'nous, the acetous, and the putrefactive fermentation, it is 'then incapable of having these processes again renewed in it. 'Much peat, especially that of an ancient date, having been

' completely putrefied, cannot therefore be again susceptible of ' any putrefaction.'—' *If recent vegetables, or fresh dung, be inter-* ' *mixed with peat, they will ferment, and by their putrid effluvia* ' *impregnate the peat earth with fertilizing matter, but without* ' *exciting any degree of putrefaction in the substance of the peat* ' *itself.*'

A too great desire to reduce every thing in agriculture, and in nature, to an exact conformity with what he conceived to be chemical principles, has drawn the respectable professor into an error. He seems to have thought, that putrefaction has run its full course on the vegetables of which moss earth is formed; and that that species of earth was altogether incapable of having that process renewed upon it, by the aid of dung, or other admixtures. But however correct the Doctor may have been in his knowledge of the abstract principles of science, he is undoubtedly in an error in his application of them in the present case. If putrefaction had run its full course on the plants that grow on moss, as it soon does on other vegetables, no part of them would have remained to form the moss earth which now covers so much of the soil. There is no stage, short of complete annihilation, that can be pointed out as the *ne plus ultra* of putrefaction. It proceeds more rapidly on some plants, and under certain circumstances, than it does on others. It may be retarded or interrupted: But whenever circumstances are again favourable, it resumes its work of destruction, and steadily pursues its course till it has reduced every part of the organic texture of the animal or vegetable matter that become subject to its destroying powers: generally it advances fastest at first, and slower after the most soluble parts are reduced. Even on moss plants, and moss earth, putrefaction, unaided by any stimulant whatever, has made, and is still making, some progress. If it had made no advances, the moss stratum would not have had the appearance of moss earth, but that of a heap of vegetables, as entire as those in a hay stack. Instead of this, however, we find that putrefaction has nearly annihilated the organic texture of the plants, and reduced them to something in the shape, not of plants, but of earth; and where the moss has been formed under nearly the same degree of moisture, the organic texture of the plants is more completely reduced in the under, than in the upper stratum.

If putrefaction had completed its course, neither moss earth, nor any particle of vegetable matter, could have remained; and wherever any thing in the shape of organic matter remains undissolved, whether it may have assumed the appearance of moss earth, or whatever other shape it may be in, it proves, beyond all possibility of doubt, that putrefaction has been retarded, and has not completed its work. Moss, according to Dr Walker's

own theory of that substance, and which is the one I have adopted, is a congeries of vegetable matter, under partial dissolution, that has been long kept almost stationary, or under a very slow course of putrefaction, by its antiseptic qualities. It must therefore be incorrect, to talk of putrefaction having completed its course, so long as one particle of the vegetable matter remains undissolved.

When timber utensils, human bodies, or other vegetable or animal substances, are buried in moss, the progress of putrefaction is arrested, or at least greatly retarded; and the thing so deposited is kept nearly stationary, for some centuries, while it remains there. But whenever any of these are dug out from under the moss, and again exposed to the weather, putrefaction, the arch-destroyer of organized vegetable and animal bodies, resumes its work of destruction, and steadily pursues its course, till every particle of the tree, plant, or body, is annihilated, and the substances of which they were formed, by vegetable or animal organization, separated, and either restored to elementary principles, or formed into new compounds. In the same manner, the antiseptic qualities of the moss earth are so powerful, as to resist, or at least retard much, the progress of the dissolving power, while the moss remains in a body. But when it is dug up, separated, exposed to the weather, and the force of dung under putrefaction, or other stimulating matter is applied to it, and the charm of insolubility broken, then the operations of putrefaction are resumed, and go on, till the whole vegetable fibre is annihilated, and the moss earth reduced to the food of plants.

Dr Walker is certainly correct when he says, that neither lime, dung, nor any thing else, can communicate putrefaction to substances that are incapable of yielding to that process. But it is not true that moss earth, or any other vegetable or animal substance whatever, is not capable of being further reduced, and ultimately dissolved completely by putrefaction. If moss earth were incapable of having the retarded or interrupted process of putrefaction again renewed upon it, it could neither be useful as manure, nor as soil; and all further inquiry anent it would be to no purpose. But, fortunately for mankind, Dr Walker is not correct in that opinion. For it has now been ascertained, beyond all manner of dispute, in thousands of instances, that when moss earth has been heated by an admixture of fermenting dung, the charm of its insolubility is broken, putrefaction resumes its work, and, as it advances, the food of living plants is thrown off from the moss earth.

Any error that the respectable Dr Walker may have gone into on that subject, would have been less interesting, were it not that it affords arguments for farmers, too many of whom

have shown a culpable indifference, or rather an unjustifiable prejudice against the use of moss as manure, after its utility had been established beyond all manner of doubt. That indifference and prejudice is truly surprising. There are few parts of Scotland where moss compost has not been prepared and used by some farmers, with such success, as to render its utility indisputable; yet many of the very farmers who have witnessed its effects, still treat it with indifference or neglect.

To remedy that evil, I would beg leave humbly to recommend to every proprietor of land, to bind all his tenants to prepare, and lay upon their farms annually, as manure, at least as much moss well fermented and formed into compost, as the amount of the dung which their several farms could be supposed to produce; and to intimate to those whose leases were not expired, that preference might be expected in their new bargains, in proportion as they prepared and applied manure to the land, and executed other improvements on their farms during their present tacks.

If proprietors of land were generally to adopt such resolutions, and they and their factors to act upon them with spirit, the value of many estates, and the produce which they yield, might, by that improvement alone, be doubled in the course of twenty years. The enforcing of such an improvement, by every means in their power, would be one of the most important duties which the proprietors of land, and those entrusted with the management of their estates, can perform to their families, their tenants, and to the nation.

In the present unprecedented state of Europe and America, when a single year of scarcity might endanger the national independence, few subjects can more imperiously demand the most serious and unremitting attention, not only of proprietors of land, but even of the Government. The abolition of certain Orders in Council, or parts of our maritime code, is all that is now required by the American government, to lay open to us the granaries of that country. But can we be certain that the noisy ruling faction of America would not raise their demands, if (as God forbid!) they saw us in want of food? Let us therefore provide for the evil before it is too late. Let some part of our ill employed mechanics be taken from their overdriven looms, and set to work in preparing manure for, and in cultivating the soil, to raise the grain we are now obliged to purchase from our enemies, or, at best, but lukewarm and jealous neighbours. Let our mosses become the sources from which our industry shall not only raise the food we need, but from which we shall raise manure to double the value of our other land; and let the learned Judge, who has discovered and

laid open to our view that source of our wealth, be hailed as the Joseph of his country.

Moss converted into Manure by various Means.

Moss earth may be formed into efficient manure, by any admixture that will excite fermentation, and bring it into a state of putrefaction.

Putrid water will bring moss earth into a state of putrefaction, and reduce it into manure. This is a substance too often to be met with, not only in cities and towns, but in villages, and more or less round every farm-house, and the houses of even the poorest cottager; to the injury of the health of the inmates, and disgust of every person of taste who views their dwellings. The richest juices of the dunghill are suffered to waste in these ugly stanks termed *midden dubs;* nuisances which neither the prospects of gain, the comforts of cleanliness, nor a sense of decency, have yet been able to banish from by far the greatest number of farm-houses. The fat juices of the cheese-press, washings of milk-vessels and kitchen-utensils, soap-suds, and other putrid water, are neither collected together, to be applied as manure, for which they are well fitted, nor even carried off in proper sewers, but too often allowed to remain in putrid stanks near the farm-houses, raising in hot weather the most unwholsome and unpleasant effluvia, injurious to the health of the family, and proclaiming, to every person of taste who approaches their houses, that they have not a proper sense of decency, and are not duly attentive to their health and cleanliness,—the very essentials of human happiness.

It will not be easy to prevent water from becoming putrid about farm-houses; but, when that happens, the most proper course is to turn it to some useful purpose; and certainly none can be more proper, or more profitable, than using it to convert moss into manure.

The oils and juices of green flax, extracted when in steep, (which by the present economy is lost, and kills the fishes in our rivers), might be used in fermenting moss, and forming it into manure. The oils and vegetable juices of flax are themselves the most valuable manure; and, by applying them, and the water they have rendered putrid, to excite putrefaction in moss, a double end would be gained: The juices and oils which are so valuable would be preserved; the fishes would not be lost; and a quantity of moss would be converted into manure.

Urine of every description ought to be carefully preserved, and applied to the putrefaction of moss. Urine, which is itself a most valuable manure, and is mostly lost through inattention, ought to be carefully preserved from either sinking into the ground where the byres and stables are built on sandy or rocky

foundations; or from its rich juices, which are very volatile, being exhaled by the sun. When it is mixed with half-dried moss, the rich qualities of the urine are preserved, and the moss is converted into manure. This may either be done, by collecting the urine into a well, covered from the sun and air, till it is put upon half-dried moss; or moss of that description may be stored up in a shed, and as much thrown daily on the floors of the byre and stable, as would absorb the urine of the cattle.

The fumes of dung, while under fermentation and putrefaction, might be rendered subservient to the reduction of a portion of moss. When dung is under fermentation, it throws off, in a gaseous state, much matter, which, if preserved and duly applied, would operate as the food of vegetables, or excite fermentation and putrefaction in moss. A thin stratum of moss earth laid over the dunghill, would prevent these substances from being either exhaled by the sun, or washed away by rains; and while they would be taken up and detained by the moss, they would bring it into a state of fermentation, and reduce it to manure.

Animal substances, of every kind, will operate powerfully, in exciting fermentation and putrefaction in moss earth, and thereby converting it into manure. Lord Meadowbank takes notice of this, and mentions, that with the body of a dead horse, ten tons of moss may be made into rich dung. From an experiment which I caused a friend make, I can not only corroborate the fact, but assert, that from the body, blood, and intestines of one horse, properly mixed with moss, and fermented by them, with the aid of some weeds, or other green vegetables, all twice or thrice turned over, no less than eighteen or twenty tons of rich dung may be formed in the space of seven or eight months. The fumes of the putrid animal substance reduces the moss earth to complete solubility; and the moss earth catches and retains the effluvia of the putrid animal matter,—prevents it from being carried off in gas,—and preserves it to enrich the soil to which the moss is applied. How commendable would it be to dispose of dead horses in this way, in comparison with throwing them into a ditch, to become the prey of ravens and dogs, and where the fumes of their carcases, under putrefaction, become obnoxious to man and beast! Twenty, or even ten tons of rich dung, worth from five to seven pounds, obtained at the expence of only a few shillings in labour, are surely a sufficient reward for such a piece of industry, besides preventing the air from being poisoned. The justices are not probably empowered to *compel* people to such acts of industry, but they certainly have power to prevent the putrefying carcases of animals from remaining unburied.

Not only dead horses, but the carcases of all animals not fit

for the use of man; and all the offals, blood, and intestines of such as are so used, ought to be disposed of in this way. The blood and garbage of one fat cow, if carefully preserved, and duly mixed with half-dry moss, would be sufficient to make several tons of dung. If only the one half of that substance were so applied, many thousands of tons of more dung might be made every year. Moss is to be found within a moderate distance, in almost all parts of Scotland; yet the blood and garbage of cattle slaughtered, even in country towns, where moss could be found often within half a mile, are generally thrown to the streets, to find their way to the rivulet. It is not uncommon, in a dry warm day, to see the sewers along the side of a street, filled with clotted blood, which remains till the rains wash it away. Much of the dung found in the belly of the animal, is, with her calf, if she has one, disposed of in the same manner; or, if any part of them be carried to the butcher's midden, probably in the centre of the town, the dogs soon scatter them over every street and lane;—an intolerable nuisance, and extremely injurious to the health of the inhabitants; and which gives but an unfavourable idea of the police of the place, and the manners and taste of the people. Their health, comfort, and pecuniary interest, would be much promoted, by mixing the blood and offals of every beast that was slaughtered, with moss earth.

Many cows, sheep, and other animals die every year, unfit to be eaten, and their carcases are generally suffered to remain where they fall; or, if at all removed, it is only to the next ditch, where they serve for food to the ravens, dogs, &c. and poison the air. The quantity of dung such carcases would make from moss would be very considerable, while their pestilential effects on the atmosphere would be prevented. No description of manufacture could yield so large a profit as that here recommended. Dung, before it can be brought to the field, must cost ten shillings, or perhaps fifteen shillings per ton, while, from the mode here mentioned, it may be made for less than a shilling per ton; and, if a just value is only put upon the other advantages to be derived from the practice, at much less than nothing.

It was truly patriotic in the Highland Society, to offer premiums for further discoveries, as to the mode of making moss undergo the putrid fermentation. Every person who has the good of his country at heart, will sincerely wish that their success may be as great as their benevolent intentions are praiseworthy. But till such discoveries are made, we ought to persevere in the use of what is already known. The modes of forming moss into dung are by no means despicable, if farmers and others could only be prevailed upon to reduce them to practice.

Industry is the chief thing wanted. By the different methods that have been pointed out of forming dung from moss, many farmers, who have moss in every farm, often in every field, might increase their dung to more than four times its present quantity, and thereby, in a few years, more than double the produce of their lands. Industry is all that is necessary to accomplish this end. While the Highland Society are offering rewards for new discoveries, I would recommend to the great landed proprietors, who have moss on their estates, to offer premiums to such of their tenants as should set the best example of industry in the modes already known, and appoint a person skilled in these matters, to teach them how to reduce them to practice.

Some farmers have reprobated the use of lime as a manure, alleging that it injured their lands: But all of them own the utility of dung, which they and their fathers have used as manure from time immemorial. The high price of the article, great expense of carriage, want of good roads, unskilfulness in carting, unpleasantness to handle, fear of running risk, &c. still serve to keep up, with some, the prejudice against lime. Here, then, is a species of manure every where suited to the state of the inhabitants. It can be obtained often on every field, the carriage seldom more than a mile or two, often no more than a ridge's length; no roads needed; soft and easy to handle; no risk to run; no money to advance. This species of improvement must be every way to the farmer's wish; and I sincerely hope and trust, they will soon enrich themselves by it.

Having anxiously taught these doctrines at much greater length, in my Survey of Ayrshire, for the Board of Agriculture, and in three different publications upon moss, all now before the public; it was perhaps unnecessary to have troubled you with a repetition of them here. But as these publications can never be expected to have a circulation any way equal to that of your valuable Magazine; and as the subjects have appeared to me to be of great interest, but not yet attended to equal to their importance, I wished, through the medium of your respectable work, to draw the attention of the proprietors and occupiers of land to that subject, in which I conceive their own and the public interest is in no small degree involved. With your permission, I shall point out, in some future Number, a few of the most successful instances of moss culture in different parts of Scotland and England that I have surveyed,—in order to establish the theory I have given, by instances of successful practice. If these remarks shall have the effect of exciting others to reclaim their wastes, and increase their manure, I shall consider my pains well bestowed. They will at any rate show, that I have done all that was in my power to promote these improvements. I am, Sir, &c. WILL. AITON.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Reply by Mr WILKIE, *to the Remarks on his Iron Plough by* '*A Mechanic.*' (See No. XLIX. p. 73.)

SIR,

ON perusing the last Number of your valuable Magazine, I observed that a person, styling himself 'A Mechanic,' has been pleased to make some remarks upon my letter 'On the introduc-'tion of Iron Ploughs,' inserted in your 47th Number.

As this *Mechanic* seems anxious, through the whole of his communication, to impress your readers with the idea, that I have not understood the subject of which I was treating, it may perhaps be necessary for me to make some reply, more particularly as what he advances, instead of improving the construction of this most valuable implement, will, I humbly presume, only have a tendency to make it still more defective. I have therefore to request, that you will have the goodness to insert the following observations in your next Number.

Your correspondent begins by stating, that the plough should be made perfectly straight on the land side, that is, the left handle should be placed in a straight line with the landside plane of the plough, instead of being set seven or eight inches to the left of that plane, as I have recommended; 'But, that the setting the 'left handle seven or eight inches to the left of the landside 'plane of the plough, does not possess all the advantages as-'cribed to it by Mr Wilkie, I hope to make appear in the se-'quel.' Your correspondent seems, however, to allow, that such position of the handle permits the ploughman to walk with ease in the bottom of the furrow, keeping the landside plane of the plough perpendicular. Now, this perpendicular position is all that I intended by such position of the left handle, and all that is required; for, if the landside plane is kept perpendicular, the plough will, of course, cut a bold shoulder, or acute-angled furrow, at least so far as the coulter is concerned in such operation. But your correspondent says, that although the plough be laid over to the landside above, still the plough will cut the furrow with the same angle as when held perpendicular. 'If Mr 'Wilkie means, that the more acute the angle of the furrow 'which is exposed to the atmosphere, the bolder and fuller the 'shoulder; I am at a loss to conceive how he can account for 'the laying the plough over to the landside above, increasing 'or making more obtuse that angle, so long as the coulter and 'bottom planes retain their relative positions.' According to the above quotation, your correspondent is at a loss to conceive, how I can account for the laying the plough over to the landside above, having any effect in producing a flat topped or obtuse angled furrow. I confess I am equally at a loss to conceive

how he comes to be so very ignorant of such a self-evident truth; for a moment's reflexion might have convinced him, that, although he lay the plough over to the landside above, still the unploughed ground retains its former level and horizontal position; and, though the right corner of the sock feather, (which your correspondent is pleased to style 'bottom plane') be raised, and retain its relative position with the coulter, still it will only make a rut in the middle of the under side of the furrow slice, and the right edge of the furrow will still rise to the same deepness which the plough penetrated when lifting the preceding furrow, however high the right corner of the sock-feather may be, especially when ploughing strong land; or, if the feather should be so broad as to cut the whole breadth of the furrow, still the work, in that case, would be very imperfectly performed, as a considerable part of the furrow would remain not raised to the depth which it ought to be. The impropriety of laying the plough over to the landside above, would be still more perceptible in a plough with a spear sock, or with a very narrow feather: the furrow in that case would rise from the bottom, parallel to its surface, and, when turned over, would appear with its angle more or less obtuse, in proportion as the plough was laid over to the landside.

From what is stated above, we may lay it down as a fixed principle, that the landside of the plough ought to stand perpendicular; and that all the other parts of this most useful implement should be so constructed, as to preserve that position while at work, as far as circumstances will permit. I shall now show, that it is only practicable to preserve that position by placing the left handle seven or eight inches to the left of the landside plane. That we may fully understand this, let the ploughman stand in the bottom of the furrow, immediately behind the plough, the landside of which is standing perpendicular; raise a perpendicular line from the edge of the furrow where the landside of the plough has just passed; and it will strike the man about five inches to the left of the centre of his body: Now, let him extend his arms to their natural position, and it will be found they reach to 12 or 14 inches on each side the centre. According to this rule, then, I regulate the position of the left handle; from the centre to the landside plane is 5 inches, from the landside to the outside of the handle 7 inches, making 12 in whole: The right handle may be placed about 30 inches from the left, as convenience or fancy may dictate.

From what has just now been stated, it is evident, that such position of the handles is necessary, in order that the ploughman may conduct the plough with ease to himself, and at the same time preserve its proper position.

The 'Mechanic,' in his remarks on the position of the coulter, which is exhibited in a cross section of the plough fig. 3., labours to prove, that such position of the coulter will only produce an angle of the furrow 7 degrees above the square, instead of from 10 to 15. 'But allowing the coulter to stand half 'an inch to the land side of the sock at the point, the angle of 'the furrow will not be so acute as Mr Wilkie is pleased to 'state, if the landside and sole-planes are at right angles to 'one another, which we presume is the case in all well con-'structed ploughs.' Here I must inform your correspondent, that the landside and sole-planes, or feathered edge of the sock, are not at right angles. The point of the sock inclines as much below the right corner of its feathered edge, as the point of the coulter stands to the left of the landside plane. Thus, the furrow is cut as much below its horizontal position at the point of the sock, as the coulter cuts it from its vertical position at the top or surface; and, when it is turned over, that which formerly was its upper surface, now inclines at an angle of 45 degrees, while each side of the angle which is exposed to the atmosphere stands about 6 degrees above the square, making the medium betwixt 10 and 15 as formerly stated. I have only to add here, that the right corner of the feather, which I have described as standing about 5 or 6 degrees above the level of the sock point, (for about an inch or so from its outer corner), inclines gradually downwards as it extends backwards; and, if it were to be continued the whole breadth of the furrow, would come nearly level with the point of the sock. This convex form of the feather cuts the under side of the furrow about half an inch concave in the middle, which, besides giving the furrow a more acute angle, has also this advantage, that it applies properly to the convex surface of the mouldboard in the act of turning. Whether the sole plane of the plough, as I have thus described it, may accord with your correspondent's ideas of a well constructed plough, I shall not determine.

What your correspondent advances upon the mouldboard, appears unworthy of any notice. He finds fault with me for not giving him proper directions for making the mouldboard. The fact is, I gave no particular directions for making the mouldboard, nor any part of the plough; but only meant to state, in general terms, that, by attending to the different figures, some idea might be formed of its construction. Many things belonging to the subject were kept undescribed. The sole of the plough, for instance, was never mentioned, which might be the reason why your correspondent could not find the other 5 or 6 degrees, that I had stated the furrow as standing above the square. Be that as it may, it is evident he was de-

termined to find fault; for he treats those parts that happened to be more particularly described, in the same manner as those that were not; a striking proof of which we have from what follows. 'In describing the profile of the plough, Mr Wilkie 'states the length of the beam at 6½ feet; which, I think, is a 'very vague expression: because the length of the beam may 'be a few inches more or less, without adding to, or diminish-'ing the distance that the point of the beam stands before the 'sock.' Now, if the body of the plough is of a determinate length, from the point of the sock to where the beam is joined to the stilt, then, of course, a beam of a certain length must stand with its fore end at a certain distance from that point. But since your correspondent thinks my statement of the length of the beam a very vague expression, I beg only to inform him, that if he will take the trouble to turn over to the figure of the iron plough, he will find a scale of feet and inches annexed, by which he may ascertain the distance at which the point of the beam stands before that of the sock, with as much precision as he has been pleased to state the one as constructed in the neighbourhood. He will there find it stands precisely 25 inches before the sock.

Now, according to "A Mechanic's" own statement, his beam is six inches longer than the one described by me, and half an inch deeper, and half an inch thicker at the coulter hole: How much the dimensions are larger in the other parts of it, he does not inform us; but, from its greater length, it must of course be more elastic, and consequently be made thicker, in order to overcome that elasticity. Hence we may conclude, that, instead of improving the construction of the iron plough, all that your correspondent has advanced upon the subject has only been a waste of words; and, from what he has communicated to us respecting his own plough, all that can be made of it amounts precisely to this, that he has made a clumsy, weighty implement, and finds it necessary to have the weight reduced: He indeed informs us, that he expects to make it lighter, while at the same time the strength will be increased: This will be an admirable improvement, unquestionably; but unless he can impart some new and unknown quality to the materials, he will most probably be behind with his intended improvement; for the combined properties of lightness and strength have perhaps already been brought to a pretty advanced state.

Fully aware, Sir, that I have trespassed upon the patience of your readers, and occupied too much of your valuable room, I shall conclude, by stating the particular weight of an iron plough, such as we are making at present, calculated to resist the strength of two powerful horses.

	Cwt.	qr.	lb.
Weight of the beam,.	0	1	20
of the left stilt,.	0	0	19
of the right stilt, .	0	0	14
of the connecting rods betwixt the stilts,...	0	0	9
of the sheath,.	0	0	9
of the head, .	0	0	8
of the sock, .	0	0	10
of coulter and wedges,.	0	0	10
of muzzle,.	0	0	5
of mouldboard, sole-shoe, & landside plates,	0	2	0
	1	2	20

The weight of a wooden plough, of the same construction, is 1 cwt. 2 qrs. Some of them may be rather lighter, but what is termed a good strong two-horse plough, with a cast-iron sheath, will amount to the above weight, at an average: The weight of both the iron plough and the wooden one might be reduced 10 or 20 lib. below the above statement, when they are to be used upon a light and mellow soil: but as it is necessary sometimes to use three horses, where the ground is steep and hilly, and also when a deep furrow is wanted; the above weight and strength will be found best adapted for general purposes.

Now, will the 20 lib. which the iron plough is heavier than the wooden one, have any material effect on the draught? It does not appear that it will. General Baillie, of Carnbrae, tried the draught of his iron ploughs by the spring steel-yard, and found them considerably lighter than his wooden ploughs, of the same construction. But that might be owing to the iron ploughs being in better trim, or to the dexterity of the holder.

From the durable nature of malleable iron, it may be expected that an iron plough will last a very long time; we know that the materials will,—if properly preserved by paint from the effects of rust. How long the framing will stand firm, or fit for work, cannot be so easily determined: that must entirely depend on the quality of the workmanship, and upon the construction: If these are deficient, it may not last, fit for work, so long, without repair, as a wooden plough.

But the greatest advantage which the iron plough possesses over those made of wood is, the facility which it affords for the application of different kinds of mouldboards, on the same plough, whereby the farmer is furnished, at a comparatively small expense, with one implement, calculated for a variety of different purposes;—for ploughing grass land,—and for summer fallow,—for a strong, and for a light soil. The same implement is converted into a double mouldboard plough with equal facility.

I am, Sir, &c.

Uddingstone, May, 1812. JOHN WILKIE.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Remarks by MECHANICUS *on the Reply to his Defence of Mr Stirling's Thrashing Machine, Vol. XII. p.* 490.

SIR,

IN your Magazine for August last, you did me the honour of inserting some remarks of mine upon the principles of Mr Stirling's thrashing machine. In a paper which appeared in your December Number, some of my arguments were opposed in a plausible manner; but the greater number were either mistaken or misrepresented. It becomes necessary for me, therefore, again to request the attention of your readers to the subject, and to endeavour to repel the arguments, and vindicate myself from the misconceptions, of your correspondent. As I do not intend to follow this gentleman in all his observations, I shall adhere to the order in which I formerly arranged my ideas, explaining my arguments where they have been misunderstood, and supporting them where they appear to have been attacked; and I shall then, perhaps, find an opportunity for making some remarks upon the manner in which my opponent has conducted the discussion.

Your correspondent affirms, that the parallel of the hammer and stone 'does not apply to the forces or velocities of Mr Stir-'ling's and Mr Meikle's thrashing machines; for,' says he, 'all the world knows, the force or velocity of Mr Meikle's ma-'chine is quite sufficient to beat out grain in the completest 'manner.' To this I shall reply, by asking the following questions. What number of strokes, in Mr Meikle's machine, is necessary to separate the grain from a quantity of straw? Cannot the same thing be accomplished by a smaller number? And if it can, what arrangement may be most advantageously adopted to give to the strokes this additional effect? The proper answer to these queries, which it does not require great skill in mechanics to give without hesitation, will, I trust, show the futility of your correspondent's objection. The quantity of force expended in any stroke, is at least not in a higher *ratio* than the square of its velocity; and the number of strokes that may be given by the same expense of force is inversely in the same proportion. Now, were the effect of a stroke only proportional to the square of its velocity, (and it cannot follow an inferior *ratio*), it is evident that no waste of force could ensue from increasing the velocity. But the case of the hammer and stone, with innumerable others of a like nature, and what is, perhaps, more directly to the purpose, the experience of every

flail thrasher in the kingdom, proves incontestably, that the effect of a stroke increases with the velocity in the *ratio* of a much higher power; and that the saving of force which may be accomplished by acting upon this principle, is almost incalculable. I formerly endeavoured to prove, likewise, that the force expended in the stroke of a thrashing machine, is in a *ratio* considerably inferior to that of the square of its velocity; and, consequently, that a still greater saving is effected than that which arises from the increased execution of the stroke. Your correspondent, however, objects to one part of my argument, on the ground that the resistance arising from friction increases with the velocity. In answer to this I shall just observe, that the sweeping law which includes all heterogeneous bodies, is by far too vague and uncertain, to admit of the confidence with which he argues from it. I have reason to think, that the nature of the friction of iron and straw has never been particularly ascertained; and it is quite contrary to all our ideas upon the subject of friction, that the quantity of motion destroyed by it, while the rubbing body passes over the same space, should be increased with the velocity with which that space is passed over. But, taking the fact as your correspondent has stated it, namely, that friction increases in an arithmetical progression, while velocity increases in a geometrical one; it is evident, that as the velocity increases, the proportional increase of friction continually and rapidly diminishes. And as the experiments from which this law is deduced must have been made with a velocity in no degree comparable to that of any thrashing machine, the total increase of friction arising from any difference of velocity in such machines must be quite inconsiderable. I have formerly shown, also, that the resistance arising from the elasticity and gravity * of the corn, is greatly diminished by adding to the velocity. And as the cause of friction is thus in part removed, the total resistance arising from friction must be diminished by increasing the velocity.

Your correspondent has quoted an expression of mine, in a manner which proves that he does not understand my meaning; and I shall therefore endeavour to make it more plain. It must be obvious to every man who has the least acquaintance with thrashing machines, that if they were to be fed with clean straw, instead of unthrashed grain, the resistance given to the stroke of the scutcher, and of consequence the force exerted by the moving

* The resistance arising from the gravity of the corn is inversely as the square of the velocity, not inversely as the velocity, as I before inadvertently stated it.

ing power, would be little inferior to that which is necessary to separate the grain from the same quantity of straw. It is by striking, and thereby communicating motion to the corn, that it is made to quit its hold; and though this cannot be accomplished, without at the same time giving motion to the straw, yet this last circumstance contributes nothing to the beating out of the corn, but is, in fact, the great obstacle to be overcome in the operation of thrashing. It is for this reason that I have considered the constant communication of motion to the straw as a source of unnecessary resistance, and as a circumstance which ought to be avoided as much as possible in every good thrashing machine. And that it may be avoided in a great degree by increasing the velocity of the scutchers, is clearly proved from what I have already advanced upon the subject.

It appears to be a favourite doctrine of your correspondent, that there must be some determinate limit, beyond which it is impossible to increase the velocity, without great waste of force. And if a quantity of straw were usually cleared of its grain by a single blow of the scutcher, the truth of the doctrine could not be denied. But as this is a thing perfectly impracticable, and since the real state of the case is so very different, the idea of a *maximum* velocity is too absurd to need any refutation. The only limit to the velocity of the stroke is its becoming so great as to injure the grain, or destroy the straw. I beg leave, however, to inform your correspondent, that the scutch-mill does neither in the smallest degree. Nor is it very difficult to assign the reason. Instead of having the sharp angular form of the beaters of Mr Meikle's, which is calculated not only to cut the straw, but also very much to increase the friction, the scutchers of Mr Stirling consist of planks of considerable thickness, and that part of them which strikes the corn is of a perfectly round form.

The great strength of my opponent's argument, however, consists in his proving, from *data* afforded by me, that the difference in the velocities of the two machines is so small, as to make it impossible to draw any conclusion in favour of either, on account of any superiority in this respect. His first step towards the establishment of this point is reducing the *medium* velocity of the scutch mill; which he accomplishes by stating the distance from the centre of the spindle, to that point of the scutcher which strikes the middle of the handful of corn, at three feet four inches, although I had affirmed it to be three feet six inches. And this he does not hesitate to do; though, in the passage upon which he founds this emendatory criticism, I have said that the aperture of the thrashing box is not more than 15 or 16 inches,—

and though I have immediately added, that the corn is seldom spread over the whole of this extent.

All that he could effect in this way, however, is of little importance, and probably would not have been attempted, had he not been able to raise the velocity of the one machine much more than he could depress that of the other. I had stated the diameter of the drum in a machine of Mr Meikle's construction at 3 feet 9 inches; and supposing it to make 340 revolutions in a minute, I stated the velocity of the beaters at 2937 feet in that time. Your correspondent, proceeding upon the same *data*, found, of course, the real velocity to be 4005 feet; and, upon this ground, set about proving the infinite superiority of the drum mill. Into the correctness of his reasoning upon this point I do not intend to inquire; since the whole argument, being built upon erroneous *data*, is good for nothing. The diameter of the drum upon which my calculation was made is 2 feet 9 inches; and the reasoning of your correspondent is founded upon an error which I must have committed in transcribing the numbers. I am very sorry, Sir, that such an oversight on my part should have given your correspondent so much unnecessary trouble. I hope, however, that after this explanation he will do me the favour of comparing the two machines upon the new *data*, or rather upon the real state of the facts, as I am convinced he will find the difference, in general, considerably greater than I have stated it.

Your correspondent has favoured us with some very judicious observations upon the rate at which horses ought to walk; but they are quite out of season, as I expressed no opinion upon the subject. His long and learned note concerning horizontal water-wheels, cannot be said to be more to the purpose; since the scutch mill is no more chargeable with their defects, than the drum of Mr Meikle would be, if such a device had been applied to it.

In obviating an objection which is made to the scutch mill, from the difference of velocity in different parts of the scutcher, I formerly stated, that the impulse which the corn receives from the stroke tends constantly to drive it towards the circumference of the circle. Upon this your correspondent observes, that it 'renders the difficulty greater, instead of less, in beating out 'the grain; because the centrifugal force, tending to drive the 'whole grain to the extremity of the opening, and beater of 'course, it is more difficult to be thrashed out collected in a 'mass, than when regularly spread over the whole opening.' Now, it is surely unnecessary for me to observe, that no body can be actuated by centrifugal force, which does not revolve round

round a centre. If your correspondent will take the trouble to study the subject, he will find, that the force which impels the corn cannot possibly collect it upon the extremity of the scutcher; and that whatever tendency it has to produce this effect is sufficiently counteracted by the force of friction. The impulse to which I referred has no dependence upon circular motion, but arises from the position of the face of the scutcher, which, instead of being in a line that, if produced, would pass through the centre of the spindle, makes with such a line an angle of about 15 degrees. The stroke, by this means, has such a tendency to drive the corn towards the circumference of the circle, that during great part of the scutcher's progress over it, nearly one half of the straw is at the distance of 3 feet 6 inches from the centre of the spindle. It may be farther observed to the same purpose, that as all the straw escapes from the scutchers by passing outwards, and over their extremities, that part of it which was at first applied nearest to the centre must receive several strokes more than that which was at first applied at the circumference; and consequently the degree of thrashing received by each must, in a great measure, be equalized. But if, notwithstanding all that has been advanced upon the subject, this difference in the velocity of the scutchers should still be considered as a defect in the scutch mill, nothing can be easier than to provide for it an adequate remedy. By using feeding-rollers of a conical form, the number of strokes received by any part of the grain may be exactly proportioned to the velocity with which it is struck.

My opponent has spent considerable time in proving, that the grain must be 'twice as thick fed in, to the scutch, as to the drum mill.' He might well have spared this trouble; for the fact is obviously admitted in my former paper; and I think I have shown, that no serious inconvenience is thereby incurred. The analogy is very close between the stroke of the flail and that of the scutcher of Mr Stirling's thrashing machine, at least in the first part of its progress over the straw, where alone the thickness of the mass has any tendency to impede its operation; and I must be allowed again to state, that all flail-thrashers whom I have seen, do bestow the greater part of their labour upon the corn, without any spreading, but that which it receives from the strokes of the flail. But I am not confined to the evidence of analogy in supporting my assertion. I shall also prove the truth of it from facts which must fall under the observation of many of your readers, and the force of which must be admitted by all.

That the objection might have its full force, I formerly admitted

mitted what might take place in some of Mr Meikle's machines; but I shall now state what often does take place in using drum mills, and those too of the same power with the scutch mill, upon which I have all along founded my comparison. It is a common practice, in using such machines, to apply to them a whole sheaf at the same time, when the length of the feeding-rollers does not exceed 4 feet; and we must not even hint that, in these circumstances, it is not sufficiently thrashed. The same quantity is generally applied to the scutch mill in 3 divisions; and, though the space over which it is spread should not much exceed one foot, it is evident, that the thickness of the corn is not one third greater than that which is applied to the drum mill. If we consider, then, the superior velocity of the scutch mill, and the manner in which the corn is exposed to its operation, the disadvantages (if any) which attend the smallness of the aperture in the thrashing box, must be very inconsiderable indeed.

But it will be said, perhaps, if the quantity of grain applied to the scutch mill be so small, how can it thrash as much as the drum mill? It is not very difficult to give a satisfactory answer to this question. The time which each of the divisions of the sheaf is held to the scutchers of Mr Stirling's machine, is only half of that which it requires in Mr Meikle's; and the divisions may, and do, succeed each other without intermission. In the drum mill, on the contrary, it is not only difficult for the person feeding to apply the corn regularly, and without interruption, but it is necessary to pause before the application of a sheaf, in order that the machine may recover the velocity which it has lost in thrashing the preceding one. Nor will your readers find great difficulty in believing the latter part of this proposition, if they attend to the following reasons in support of it. If the *medium* velocity of the scutch mill be to that of the drum mill, in the *ratio* of 3 to 2, and if the resistance given by a quantity of corn to the stroke of the scutcher is in proportion to the square of its velocity, the number of strokes which the former machine can give to a certain quantity of grain, is to that which the latter can give to the same quantity, with the same expense of force, in the exact *ratio* of 4 to 9. But if the number of strokes given by the drum mill were to that given by the scutch mill, in the proportion of 3 to 2, and the quantity of corn exposed to the respective machines, in the proportion of 3 to 1, the force expended by the former would be to that expended by the latter exactly in the *ratio* of 2 to 1. Now this, in a machine of the same power, is perfectly impossible. If the drum mill, then, after the application of one sheaf, be not suffered to accumulate

accumulate motion before the application of another, its velocity must be destroyed, and the work cannot be continued. It is no disadvantage, therefore, to the scutch mill, that only a small quantity of corn can be applied to it at the same instant. Every machine which is constructed upon the principle of an increased velocity, must in some degree possess the same property.

Notwithstanding all that has been advanced to the contrary, I cannot help thinking, that the nearness of the cover to the scutchers is a great defect in Mr Meikle's machine. This circumstance is, without doubt, absolutely necessary in the present state of the machine; and it cannot be denied, that, by this means, the grain is more quickly brought back to the stroke. But this is not the only consequence attending it. The cover is naturally so near to the scutcher, that a small quantity of straw completely fills up the interval; and thus, while the scutcher presses upon one side of it, the cover constantly presses upon the other with all its weight. A prodigious increase of friction is the inevitable consequence; and yet it is obvious, that, as the direction of the stroke is parallel to the surface of the cover, this continued pressure has no share in beating out the grain, but rather tends to retard the process. In the scutch mill, the gravity of the straw, and the force with which it recoils from the cover of the thrashing box, are quite sufficient to bring it back to the stroke; yet the cover is placed at such a distance from the scutchers, as not to create any thing like a continued pressure upon the greatest quantity of grain that is ever applied to the machine.

In answer to your correspondent's remarks upon the application of feeding-rollers to the scutch mill, I have only to refer him to the Encyclopædia Britannica, (Art. *Thrashing-machine*), where he will find it recorded, that fluted feeding-rollers formed an essential part of the first thrashing-machine attempted by Mr Stirling. Whether these were the first fluted rollers ever used, I shall not pretend to determine; but this at least is certain, that they were used about 30 years before the first of Mr Meikle's machines was erected. Although Mr Stirling thought that the machine which he afterwards invented stood in no need of feeding-rollers, I appeal to yourself, Sir, whether a descendant of his may not safely use them, without being chargeable with stealing Mr Meikle's invention. But whatever may be decided upon this question, it can have little effect upon my argument; for I must inform your readers, once for all, that with moderate attention on the part of the person feeding, grain may be thrashed by the scutch mill in the most perfect manner, without the aid of feeding-rollers, and without any of that danger which has been so often and so feelingly descanted upon.

Have

Having now, I trust, obviated the force of all the arguments which have been advanced against me, I should, perhaps, bring my paper to a conclusion, and submit it to the indulgent consideration of your readers. But the way in which I have been attacked betrays such a want of candour and consistency, that I cannot avoid taking some notice of it.

Had it even been true, that after accurately stating the dimensions of a drum, I had calculated its velocity so erroneously, (which I think must have appeared very improbable), yet it argued not only a great want of candour on the part of my opponent, but also a thorough contempt for the understandings of your readers, to set about proving the superiority of all drum mills, from this single case, which he knew to be so very different from every other. But this is not the only specimen of his abilities for managing a dispute, with which this gentleman has furnished us. By stating the length of the thrashing part of the scutchers at 16 inches, * he succeeds in increasing the difference of velocity in its opposite extremes, and in bringing the velocity of the scutch mill nearer to that of its ideal rival. But when it suits his design to shorten the aperture of the thrashing box, and to magnify the disadvantages resulting from its shortness, he is then † willing 'to take the gentleman's own *data*, viz. 14 inches of the opening of the scutch mill cover to be occupied with grain.' In one place, ‡ he lays great stress upon the number of strokes which grain receives in passing through a thrashing-machine; while, in another place, § where it was not only natural but highly necessary to take notice of the same circumstance, he has studiously kept it out of sight. It would have rendered the absurdity of an 'ample and sufficient velocity' by far too palpable.

But he likewise argues, in one place, upon principles which, in another, he had strenuously endeavoured to overthrow. He attaches great importance to the circumstance of the velocity in one part of Mr Stirling's scutchers being less than that of the imaginary drum mill; and proves, that it must greatly diminish the quantity of work which the machine is capable of performing. But with all his ingenuity, he has not been able to make the least velocity of the scutchers less than 3240 feet in a minute; and as this is considerably greater than 3000, which he had elsewhere ‖ affirmed to be 'ample and sufficient,' he could not, consistently, draw any conclusion from this circumstance to the disadvantage of Mr Stirling's machine. And let it not be supposed

* Farmer's Magazine, Vol. XII. pp. 492 and 494. † P. 494.
‡ P. 495. § Pp. 491 and 492. ‖ P. 492.

posed that, in reasoning after this manner, he intended to expose the absurdity of the principles upon which my argument was founded. He sums up the whole discussion in the following words.* 'Upon taking a view, then, of the capabilities and 'executions of the two machines, upon true mechanical princi- 'ples, it appears that the drum machine is infinitely superior to 'the scutch machine.'

There are instances, also, in which your correspondent's reasoning appears to me very inconclusive. In one place,† he says, 'But let us see what will be the consequence if the same 'quantity of grain pass through the scutch mill in half the time 'it passes through the drum mill.' It is, perhaps, unnecessary to state, that I never made any such assertion. Your correspondent, however, sets out in this manner; and, after a process of reasoning truly original in its kind, but to which it is impossible to do justice by any abstract, he arrives at the conclusion, that 'grain must be fed in twice as thick to the scutch, 'or Mr Stirling's, as to the drum, or Mr Meikle's machine; 'and only be held half the time to be beat.' In the same paragraph, he sums up his argument in the following sentence, 'In fact, as the velocity of the middle point of Mr Stirling's 'scutchers has a mere trifle only, viz. $\frac{1}{33}$th part in the minute 'of more velocity than the equable velocity of Mr Meikle's 'scutchers; and as Mr Meikle's strokes are to Mr Stirling's as 'about 7 to 4 in number, in the same time, Mr Meikle's ma- 'chine ought, on the very *data* afforded by *Mechanicus* himself, 'to thrash about seven times, at least upwards of six times, the 'quantity of grain that Mr Stirling's possibly can in the same 'space of time.' I am utterly at a loss to conceive what principles of ratiocination,—what *data* that I have given, or that he has assumed, can possibly warrant this conclusion.

My opponent has omitted no opportunity of appealing directly to popular prejudices, and of doing all that he could to hold up my paper to ridicule. This manner of treating the question, when candid statements and correct reasoning would have been so much more to the purpose, amounts to an indirect confession, that he was unable to defend his opinion upon more solid grounds.

It is with the utmost reluctance, Sir, that I am forced to make these observations; and I sincerely hope, and earnestly wish, that it may never again be in my power to make any such with justice. I remain, Sir, your's sincerely,

MECHANICUS.

Dumbartonshire, Feb. 1812.

TO

* Farmer's Magazine, VOL. XII. p. 497. † P. 494.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Table of the Letting Prices of Land.

Names of Farms.	Situation.	Parish.	Quality of Soil.	Extent of Acres.		Length of Lease.	Price at which they are let per acre.
				Arable.	Pasture.		
Meadowfield.	2 miles east of Edin.	Dudding-stone.	Uncommonly rich loam.	43		years. 11	
House of Muir.	7 south of Edin.	Glencorse.	Dry, free, and fit for turnip-husbandry.	200	400	19	
Primroschill.	10 south of Edin.	- - -	Rich clay.	100		19	
Carrberry Mains.	6 east of Edin.	Inveresk.	Wet clay.	90		19	

SIR, 1*st February*, 1812.

I communicated to you, on the 25th of November last, my idea as to the practicability of the prices of land being reduced to the periodical standard of a price-current.

I am fully aware of the difficulties which must always attend a direct statement of the price of an article so highly variable and naturally diversified, as must always be the local situation, terms of lease, and quality of land; but when it is considered that all land under lease must have a letting price of some kind or other, the difficulties certainly cannot be insuperable. In order more fully to illustrate what I mean, I have prefixed a form of a Table, in which I have made an awkward attempt to reduce to practice, what I have been aiming at in theory. In this table, I think it practicable that the name, situation, parish, quality, extent, and lease of the lands, together with the rent at which they are, in reality, lately let, per Scots acre, may be stated each under its proper column, which will have this advantage, that in place of a general or average statement, the above table will contain individual statements, founded upon the facts of farms recently let.

I do not mean that the above is to be considered as any thing but an imperfect model of a land price-current. I have

no

no doubt, that something much more useful, always founded upon accurate local information, may be found; and if what I have suggested shall lead to any statement or list tending, in the least, either to simplify or augment agricultural information, it will then have fulfilled the object wished to be accomplished.

Notwithstanding the high and extravagant pitch to which good land has got, and the low prices which have been of late obtained for corn and other produce, there has still little or no absolute fall in the price of land taken place. Every empty farm soon finds a tenant; and those who are the loudest to raise the outcry of a high rent, are often the first in stepping forward, with desperate and doubting step, to be the highest bidder.

It appears that the population of Scotland since 1801 has increased 208,180; which is equal to 13 *per cent.* increase within the last ten years, or very near one-eighth part.

Thus, the means of subsistence must either have increased one-eighth, or will fall one-eighth short of supplying the country in the way in which it was supplied before; but the country had to import corn before, which proves it had not enough for its population then.

From what fund, then, does the increase of one-eighth subsist? Is it from an increase of land brought into arable management? Is it from new channels of trade opened to our commerce? Or, Is it from that redoubled industry, of which man is capable when necessity calls his powers into action?

So many are willing to cultivate land, and to sell goods without any profit, that it is rare to find a new lease that will yield a fair return. Under these well known circumstances, it is certainly an arduous task to tell the honest man how to live by his business: And what may be the effect of this,—how far it will go, and where its remedy lyes, is not for us, the ignorant, to prognosticate, nor the simple to foretel. I am, Sir, your most obedient,

SIMPLICITAS.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Letter from the Secretary of the Holderness Agricultural Society.

SIR, *Hull, 16th April* 1812.

BY order of the Holderness Agricultural Society, I have to request that you will insert the following paper in your next Farmer's Magazine. I am, Sir, your obedient humble servant,

A. STOVIN, *Sec.*

THE

THE Holderness Agricultural Society held its quarterly meeting at Hedon, on Monday the *thirtieth* ult. which, as usual, had a numerous attendance. Bulls and boars were shown for premiums; both which species of animals, it was generally admitted, continue to improve in the district, and which is to be attributed to the spirit of emulation excited by the Society. The following questions were discussed—'What are the causes 'of the frequent failures of wheat crops on bean or clover 'stubbles?—What is the sort of seed best suited to those 'stubbles, and what the best time of sowing?—Is any, and 'what, course of husbandry better adapted to the soils in 'Holderness, than the course in which it is the practice to 'sow wheat on bean or clover stubbles?'

The following tribute of respect was paid to the memory of the late Henry Maister, Esq. 'Since this Society last 'met, it has had to lament the death of a worthy member 'Henry Maister, Esq. who, without any ostentatious display, 'stood in the first rank of agriculturists. His agricultural career commenced in early life. Unbiassed by prejudice in favour of old established systems, he was ever ready to submit 'to the test of experiment new suggestions, when supported 'by plausible theories. Not only did he readily adopt every 'project of improvement the moment its utility was ascertained, but at his own charge, in opposition to contrary prejudice, and notwithstanding almost personal ridicule, he persevered, and brought before the eye of observing farmers the 'result of experiments, which the prospect of expense would 'have deterred them from ever pursuing. When stationed 'with his regiment, as Colonel of the East York Militia, in 'distant parts of the kingdom, he was still alive to this his 'favourite pursuit, the interests of which never escaped his 'attention. If he observed any practice in a distant district, 'or any implement which he thought might be usefully adopted in Holderness, he not only introduced them, but, what 'is more essentially important, sent men acquainted with the 'practice, and accustomed to the use of the implement. In 'the year 1802, he became a member of this Society, to the 'important objects of which he was ever most attentive; and, 'when his other duties would permit, was never absent from 'any of its meetings. Of any experiment suggested by the 'members, he was willing to make trial; and promptly submitted the result to their consideration. All his modes of 'management exemplified in the cultivation of his own farm '(and which is equalled by few) were directed to the general 'advancement of agriculture, and particularly in Holderness.

'—Impressed

'—Impressed with these sentiments, the Society would be deficient, not less in that regard which is due to their own interests, than in proper respect to the memory of their departed member, if they neglected bearing public testimony to his active and distinguished merits in promoting the great design of their Institution. To discharge this duty, and to invite others to follow his example, the Society unanimously resolves that this their testimony be entered on their journals; that a copy of it be transmitted to Mr Maister's family; and that it be inserted in the Hull newspapers, the Farmer's Journal published in London, and the Farmer's Magazine published in Edinburgh.'

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Thoughts on Harvest Management.

SIR,

IT must be quite obvious to every one who is in the smallest degree acquainted with rural matters, that at no season of the year is the farmer's interest so much at stake as during harvest; and when adverse weather, such as that of last year, happens to prevail at that period, it often occasions no small grievance, as well as serious loss, to the corn farmer. Therefore, whatever tends in the smallest degree to obviate this evil, or, what is much the same thing, to lessen the trouble and danger to which the crop in such seasons must inevitably be exposed, will, I apprehend, readily meet your concurrence.

Such is my object in troubling you with the few following desultory hints, which I take the liberty of offering to the public through the medium of your publication; not because I think they possess, in every respect, sufficient merit to claim insertion in that valuable repository of agricultural knowledge, but, the principal motive being good, you will hold me excused, if, as I hope, some of your readers may be benefited by them.

In the part of the country where I reside, as also in some of the conterminous districts which I have had occasion to notice, it has been customary, I believe, from time immemorial, when erecting stooks in harvest, to place the sheaves in such a manner, that what is generally termed the *corn knot* of the band may, without exception, be placed on the outer-side of the stook. Now, what might have been the original cause, or may be the reason for persisting so invariably, and for such length of time, in this fanciful practice, I am really at a loss to discover. Indeed, were I to hazard a conjecture, my idea of the matter

matter is, that in the more early stages of agricultural improvements, when that art was yet in its infant state, and before the introduction of that beneficial invention summer-fallow, and all those meliorating leguminous crops which now are so universally cultivated, corn crops of every description, in point of straw, behoved to be considerably more unequal in growth than they are at present; of course, it became necessary in harvest, for the reapers, in order to procure a sufficient length of rope for binding their sheaves, to be now and then pulling it up by the roots, instead of cutting it, the way now generally practised. It is but reasonable to imagine that there would naturally adhere more or less of the soil to the roots of the straw; consequently, if a good deal of attention was not employed in shaking it off, and if bound in this manner, and stooked at random, and the subsequent weather had set in rainy, before any favourable opportunity presented itself for carting it off the fields,—in such cases, it is evident that all the earthy knots exposed to the inclemency of the weather would speedily encourage sprouting, especially as the grain then was so much intermixed through the sheaves. With a view to prevent this, the practice alluded to may have been adopted.

Allow me now to urge a few reasons in favour of what I conceive to be a preferable method, and which, in short, is nothing more than placing all the sheaves in the stook in a quite contrary way to that just now described; or, in other words, to have all the corn knots undermost (not even the hood or head-sheaves excepted), in place of being exposed at large to all the vicissitudes incidental to harvest weather.

It is well known, that when the crop has unavoidably to encounter a series of bad weather while in the stook, no part of it is more subject to sprout, than that which is compressed so closely in the knot of the band; nor is this such a small proportion, I am aware, as many may be apt to imagine.

Last autumn, I had the curiosity to make a trial of the proportion the bands might bear to the sheaves, and found, upon examination, that a sheaf which measured from ten to eleven inches in diameter at the knot (and which is considered as size enough) contained exactly thirty such bands. However, by stating this, I do not wish to be understood as insinuating, that by the universal adoption of the above method, one thirtieth part more of the crop could be saved from destruction. No; all I mean to infer is, that as the cultivation of culmiferous or white crops, is now carried on upon a greatly improved system, compared to the practice thirty or forty years ago; hence, generally speaking, they are found to be considerably more abundant

in

in straw; of course, it seldom becomes needful to pull that which is used as bands, being, in most cases, sufficiently long to admit of being cut. I am decidedly of opinion, were the sheaves to be stooked in the manner here recommended, that, in rainy seasons, such as last year, there would be saved from destruction, without the smallest trouble, a portion of grain, at any rate of too much value to be inadvertently neglected.

Before I conclude, I am inclined to think, and I believe it is pretty generally admitted by others, that, independent of the above mentioned alteration, it would be of some advantage in late harvests, particularly on this north east side of the island, to have the position of the stooks somewhat different from that usually adopted; that is to say, turned with their ends pointing nearly in the direction of S. W. and N. E., or to what is provincially termed *three o'clock at noon*, instead of the customary way of right south and north. By this mode, the stooks would have less chance of suffering from the effects of bad weather; * as, by standing endways, or nearly so to the storm, it is evident they would sustain considerably less damage than when their broadside is wholly exposed; and that, with the exception of three end sheaves, they would be found to be comparatively sooner ready for ingathering after adverse weather, than when a different position is generally adopted. I know it to be a prevailing maxim with some people to have the position of their stooks regulated entirely by the direction from which the wind blows at reaping time. This, I suspect to be rather a precarious method; for certainly, in blowing weather, it would be more advantageous to leave them unhooded altogether, until such time as it became more moderate, or until the appearance of rain, than to have them entirely misplaced, merely in order to have the hooding process effected. Judging the verbosity of my style a sufficient apology for discontinuing the subject, I remain, Sir, respectfully, your, &c.

1*st May*, 1812. J. G. F.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On Spring Wheat.

Sir,

It frequently happens that wheat crops are so much injured, during winter, by the inclemency of the weather, grubs, &c. &c. that, towards the latter end of spring, they become so very

* The weather most prejudicial to us in harvest, is, in nine cases out of ten, from the east.

very thin, as to occasion their being ploughed up to be sown with oats or barley. This was the case with a crop of red wheat, in 1810, which was so very thin about the latter end of April, that I had determined to plough it for oats. But it occurred to me, that as the wheat was drilled (at 10½ inches distance, and seven rows on a ridge), the intervals might be sown with spring wheat, so much recommended by Sir John Sinclair in your Magazine. For this purpose, I horse-hoed the six intervals, three or four inches deep, with the three-pronged horse-hoe, described in the Northumberland Report, and in Brown's Treatise on Rural Affairs; and in the *last week of April* drilled spring wheat, at the rate of 1½ bushel per acre, on the intervals between the rows of the growing red wheat. The only doubt of the experiment succeeding was, whether the two species would ripen at nearly the same time. The result proved very favourable; for they were ripe within a few days of each other; and the crop was more than double what it would have been, if this operation had been neglected, and of more value, by at least two pounds an acre, than a crop of oats would have been.

As the above experiment may be practised with success, under similar circumstances, you may probably think it worth recording in your valuable Miscellany. I am your, &c.

B. C.

FOR THE FARMER'S MAGAZINE.

On the Disease in Turnips, provincially termed 'Fingers and Toes.'

[A pamphlet, with the title of "OBSERVATIONS *on the* DISEASE *in* TURNIPS, *termed in Holderness* 'FINGERS AND TOES,' *read to the Holderness Agricultural Society, December* 23. 1811, *and printed at their request—By* WILLIAM SPENCE, *F. L. S. and Member of the Wernerian Society of Edinburgh,*" having been lately transmitted to the Conductor, by the Author, with a liberal permission to copy it, or make extracts from it at pleasure; it is hoped the following description of the disease—the supposed cause of it—and probable means of prevention—may be acceptable to our readers, and beneficial to some of them in the southern parts of the island; for we believe no such disease is known to prevail in Scotland—at least in those counties where turnips are most extensively cultivated. We beg the learned and ingenious author to accept the expression of

of our gratitude for his communication; and shall be glad to hear from him, and other members of the Holderness Society, upon any subjects connected with Agriculture and Rural Economy. We doubt much that the Society will not obtain the information solicited, from this part of the kingdom; but if we shall be favoured by any observations that may appear useful, the Society may be assured that they shall be communicated to their secretary, Aistroppe Stovin esq. Anlaby Road, near Hull, agreeably to their request.]

Description of the Disease in Turnips, termed, in Holderness, 'Fingers and Toes.'

'This disease affects the root of the turnip, which assumes very various appearances. In some plants, the bulb itself is split into several finger-like diverging lobes. More frequently, however, the bulb is externally tolerably perfect, and the tap root is the part principally diseased; being either wholly metamorphosed into a sort of misshapen secondary bulb, often larger than the real bulb, and closely attached to it; or having excrescences of various shapes, frequently not unlike human toes (whence the name of the disease), either springing immediately from its sides, or from the fibrous roots that issue from it. In this last case, each fibre often swells into several knobs, so as distantly to resemble the wire and accompanying tubers of a potato; and not seldom one turnip will exhibit a combination of all these different forms of the disease. These distortions manifest themselves at a very early stage of the turnip's growth; and plants, scarcely in the rough leaf, will exhibit excrescences, which differ in nothing else than size from those of the full grown root. As far as observations have been made, it appears, that bulbs which have attained the size of a walnut without showing marks of distortion, will not subsequently become diseased.

'The leaves discover no unusual appearance, except that, in hot weather, they become flaccid and droop; from which symptom, the presence of the disease may be surmised without examining the roots. These continue to grow for some months, but without attaining any very considerable size, the excrescences enlarging at the same time. If divided at this period with a knife, both the bulb and the excrescences are found to be perfectly solid, and internally to differ little in appearance from a healthy root, except that they are of a more *mealy* and less compact consistence, and are interspersed with more numerous and larger sap-vessels. The taste, too, is more acrid; and on this account sheep neglect the diseased plants. Towards the ap-

proach of Autumn, the roots, in proportion as they are more or less diseased, become gangrenous and rot, and are either broken (as frequently happens) by high winds, or gradually dissolved by the rain. Some, which have been but partially diseased, survive the winter; but of the rest, at that period, no other vestige remains, than the vacant patches which they occupied at their first appearance.

'There is another disease, of little importance to the agriculturist, which, from its close resemblance to that in question, which it frequently accompanies, and, from being often confounded with it, requires to be here adverted to. In the disease to which I now allude, the bulb, and frequently the tap-root, of the turnip, is beset with one or more gall-like knobs or protuberances, which, on being opened, are found each to include a minute white or yellowish grub, without feet, and with a head furnished with two brownish jaws. This disease (if so it may be called, for I am not aware of its doing the turnip any material injury), is much more common than that of fingers and toes. But the fact is, in the excrescences of a root infected *solely* with fingers and toes, no insects, except such as came there by accident, have yet been observed; while in roots infected *at the same time* with the knobs now under consideration, a grub would be detected, which, by observers unacquainted with the distinction, would be naturally considered the cause of the former disease.

'The turnip, the Swedish as well as common, is not the only plant infected with fingers and toes. The *Runch* of Holderness (*Kellock*, *Charlock* of other districts, *Sinapis arvensis*), and rape, are both subject to it, often to the great injury of the latter: the liability of which to this disease was first observed by Mr Brigham of Bilton.

'The disease of fingers and toes, though it has existed in Holderness at least these forty years, and is so prevalent there in some districts, as nearly to preclude the cultivation of turnips on land otherwise well adapted for them, does not appear to be generally known. In nearly thirty of the county reports published by the Board of Agriculture which I have examined, I do not find any allusion to it, except in those of Norfolk and Lincolnshire by Mr Young; in which last county it has been known as long as in Holderness, and there first received the name adopted in the latter district. But however local it may hitherto have been, it is certainly now spreading. It has lately made its appearance on the Yorkshire Wolds; and as I learn from William Roscoe esq. of Allerton, near Liverpool, a friend of his in Cheshire last year lost a great part of his crop by it.

'The

'The only work in which I have met with any correct account of this disease, is Marshall's Rural Economy of Norfolk (vol. II. p. 37.), to which my attention was directed by an extract in Dickson's Agriculture (p. 665.), some time after I had drawn up the heads of the following paper. The brief account of the disease which Mr Marshall gives is very accurate; and I was glad to find so acute an observer entertaining nearly the same idea as to its origin as that which I have advanced.'

Cause of the Disease.—The author observes, 'Thus apparently foiled in the track to which I had been at first conducted, I turned my inquiries into another direction, and endeavoured to ascertain, how far the facts known corresponded with the supposition of the disease being attributable to some other cause than the attacks of insects. The only other probable causes seem reducible to the following heads.

'1st, It may be supposed to be owing to some defect in the seed; or,

'2d, To the time of sowing, or to circumstances attending that operation; or,

'3d, To some original quality in the soil subject to it; or,

'4th, It may be attributed to some quality in the soil, brought on by a particular course of cropping or of tillage.'

Mr Spence, after endeavouring to show that the disease is not owing to any of these four causes, hazards his own opinion in the following terms;—a theory which he then proceeds to reconcile with the cases he had previously detailed.

'Thus led to the conclusion, that the disease is not attributable to any of the causes assigned—that it is not owing to the seed—nor to the time of sowing—nor to any quality of the soil, either original, or induced by any particular mode of cropping, or of tillage—I shall be asked, to what then *is* it owing? I answer, that the most attentive and unbiassed consideration of the facts in my power to give, has led me to revert to my first supposition, and to infer, that the disease, though not produced by any insect that has yet been discovered, is yet caused by *some unobserved species, which, either biting the turnip in the early stage of its growth, or insinuating its egg into it, infuses at the same time into the wound, a liquid which communicates to the sap-vessels a morbid action, causing them to form the excrescences in question.*'

Under this head it would have been of importance to the inquiry, if it had been stated upon what soils, and after what rotation of crops, the disease has been found most prevalent; and in particular, whether, if any such experiment has been made, it affected turnips drilled and horse-hoed, as well as those sown broadcast.

Prevention of the disease.—This, though it occupies the smallest room in this paper, is undoubtedly the most important question; and we shall therefore insert the whole of this part, with the notes belonging to it.

'Having thus detailed the result of my inquiries relative to the cause of fingers and toes, I shall beg to add a few words respecting the cure, or rather prevention of the disease. This, it will be remembered, Mr Baker said, had been effected by himself, in Norfolk, by the use of marl; and Sir Joseph Banks informs me, he completely accomplished the same object by employing the same material. The following are his words—"The remedy applied in my own particular case has been marling. I took from a tenant land that had ceased to grow turnips from long usage, though it had in my memory grown good ones. This land I marled with a marl very nearly similar to that used in Norfolk. The success has been complete: For several crops since grown upon it, I have challenged my neighbours to show me as good turnips, and have seldom been equalled."

'Confirmed by such testimony, there can be no doubt that marl is in some parts of the kingdom an effectual preventive of the disease. The misfortune is, that in many districts—in Holderness amongst the rest—this remedy is unattainable, or not to be procured but at too great an expense. A valuable hint, however, of Sir Joseph Banks, confirmed as it is by the experience of Mr Brigham, seems to point out a succedaneum which may be applicable where marl cannot be procured. Sir Joseph observes, "I believe myself, that an addition of mould of any kind that has not borne turnips will be advantageous; and should recommend, if marl is not attainable, a heavy dressing taken from banks, head-lands, ditches, and such other unproductive materials as most farms will furnish. This, if mixed with a good dose of lime, I have no doubt will answer; though, I confess, it is an expensive remedy." Now, though experience in Holderness does not establish the efficacy of the latter part of this suggestion, lime having been applied without effect, * the importance of the former part of it is strongly proved by the fact before alluded to, observed by Mr Brigham, who found that the ridges of his land, from which all the surface mould had been removed, and consisting of mere clay well manured, produced good turnips; while the furrows, composed entirely of

* 'I am indebted to William Roscoe esq. who has had the goodness to propose for me, to a friend of his in Cheshire, a sufferer from fingers and toes, several queries on the subject, for the information, that lime has been there also frequently tried in vain for the disease, which they believe to be caused by an insect that wounds the turnip early near the crown. They conceive that an oily manure, such as a compost of whale blubber and waste soil, would probably answer better.'

of surface soil, were infested with fingers and toes. A more powerful corroboration of the solidity of Sir Joseph Banks's ideas, as to a remedy for the disease when marl is unattainable, could not have been offered; and whatever may be its cause, they seem—thus confirmed by experiment—to point out an almost sure mode of prevention.† Aware, however, how often theoretical agriculturists, like myself, commit themselves when they 'venture beyond their last,' I shall not dilate on inferences, which the members of the Society will be much more competent to draw from these facts than myself: nor will it be necessary to press upon so enlightened a body, the expediency of bringing them to the test of further experiment. I shall merely venture to suggest, whether, in soils with a substratum of clay, deep ploughing, so as to mix a portion of this earth with the surface soil, may not be the cheapest mode of supplying the remedy indicated.'*

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the surest Means of improving the Breeds of Sheep, and the Quality of Wool. By the Ettrick Shepherd.

Sir,

At this time, when so many British farmers are speculating on the improvements in the breeds of sheep, perhaps the following short observations may prove acceptable to that class of your readers engaged in pasturage.

The attention of the sheep-farmer has, for these many years bygone, been chiefly occupied in improving the quality and texture of his wool; and yearly experience is teaching him, that his attention to that commodity is still becoming more and more necessary. The pecuniary advantages resulting from every improvement in this line are indeed become so obvious, that many farmers have been induced, in order to realize a lucrative annual return from their flocks, to risk a change of breeds from one climate to another, and from one soil to another, which deliberate reflection could never have justified, and which dear-bought experience has too often proved to be fraught with danger

† 'I am informed by Dr Alderson, that Mr Richardson of Limber, in Lincolnshire (and it is said the same remedy has been applied with success upon the Yorkshire Wolds), has effectually prevented the disease by the application of chalk. This, however, is a remedy unattainable in Holderness but at a very great expense.'

* 'In lands infected with fingers and toes, some part of the injury may possibly be prevented by judicious hoeing, as the drooping of the leaves of the diseased roots, in a hot sunny day, will enable the hoers to select these from the sound plants.'

ger and loss. I do not pretend to dictate to your readers: the farmers of Britain require only to be assured of what is their true interest, immediately to adopt the plan pointed out to them: And it is a well-authenticated fact, that the surest way of attaining eminence in any improvement, whether of arts, sciences, or rural affairs, is to attempt but little at a time.

From these prefatory remarks you will easily discover, that I am going to recommend the improvement of the original breeds of each district or farm, rather than the too common practice of bringing a costly stock from a distant county, and from a soil and climate, in every respect completely different, all at once. Every practical farmer knows, that the removal of a stock of sheep to another farm, even in the immediate neighbourhood, is often attended with the most fatal consequences. What then can be expected when they are carried to such a distance? Believe me, Sir, this incongruous method of changing all at once, has, instead of forwarding the improvement of wool, tended most of any thing to impede it; for, besides the individuals who have been hurt or ruined by the experiment, the losses which they suffered have generally disgusted others at all such attempts.

As the form of the sheep, and quality of the wool, then, depend at least three-fourths upon the ram, I would gladly draw the attention of my countrymen to the more sure and more natural method of improving their breed by introducing improved rams, than by expending an exorbitant sum on a stock, one-half of which they are likely to lose, at least, before it becomes naturalized to the soil. Perhaps three-fourths of all the sheep in Scotland are yet of the black-faced, coarse-wooled breed; and it is a curious fact, that though these farmers all maintain that the Cheviot sheep will not thrive on their pastures, and though they readily acknowledge that the wool is their great staple commodity, yet, instead of endeavouring to improve the quality of their wool, the coarsest wooled ones are always preferred, and to this day most in fashion; nor has one single experiment, as far as I know, ever been made to ascertain, whether a black-faced sheep with horns was capable of bearing a fine fleece. To every suggestion of this nature which I have made to farmers, I have always received for answer, that the woolstaplers had one fixed price which they gave each year for each kind of wool; and as their's, though they should make it ever so fine, would still only be the wool of short sheep, they would get no more than others; consequently they preferred coarse wool, which they thought heavier; and that, besides, the fine-wooled sheep of that sort were always ill shapen. This last position I readily

readily allow, that the fine-wooled short sheep (for there are some of them very fine-wooled) are generally low at the shoulder, and long in the sides and the neck. This seems to be the natural form of a sheep, the form in which they were originally created; for all stocks of whatever breed tend to that form, if not constantly crossed; and, for my part, I see no objections to this form. They are generally the heaviest and strongest of a flock; and it has perhaps been partly by the indulging of this form, that the Spaniards have excelled us so far in the article of wool.

But, laying aside this suggestion, of improving the wool of the Scotish sheep, which however plausible in theory, and probable to the eye of reason, cannot be authenticated from practice, where is the hinderance, or where is the danger of putting fine-wooled rams, of the Cheviot breed, or any other, to a flock of short ewes? I hope to convince you, Sir, by one single consideration, that it is the safest, the surest, and, on an average of a lease, the most profitable experiment that can be adopted in any coarse, stormy, or mountainous district. It is thus that the very first cast of the mongrel breed between the Scotish ewe and the Cheviot ram, triples the value of the wool; and instead of lessening the quality of the live-stock, it enhances and strengthens it in a very high degree,—that mixed breed being the strongest and heaviest of all mountain stock, and yielding to no other in hardiness. The wedders of that mongrel breed have frequently been known of late to bring higher prices than the truest Cheviot breed, owing to the great weight to which they can be fed.

Many farmers will not reason on this head, but finish at once by telling you, that of whatever kind they keep their stock, they are resolved to have them of a true kind, and never shall have any of those ugly half-bred animals. Such prejudices, Sir, it is almost needless to combat. I shall only, through your medium, ask these gentlemen, a few simple questions. When you weigh your wool, whether do you like better to give five fleeces to each stone, or seven? When you have weighed it, and come to settle with your merchant about the price, whether do you like best to get seven shillings per stone, or twenty? Whether is a wedder that weighs 13 lib. per quarter, or one that weighs only 12 lib., preferable? These queries, one would think, are very easily answered; and it will be found, on a minute investigation, that these approach at present as nearly to the average returns from each breed as it is fair to calculate. Nor does it make the smallest difference whether the wool is dear or cheap; for the cross breed even of the very first cast, will always be much above

double

double the price of the short-sheep wool. The farmer who has only profit in view, should not hesitate a moment between the two alternatives; but he who farms only to please his eye, acts with great propriety in adhering to his old system. The farmer who crosses his breed with improved rams, besides the immediate increase of his profits, has likewise this further encouragement, that his flocks are always growing finer; and if his lands lye in a high situation, let me assure him there is more danger that his stock will grow too fine, than that it will remain long too coarse.

To the farmers who cannot endure the sight of any other sheep than those that have black faces, I would recommend a cross breed between the Scotish and South-down breeds, which is a very handsome animal, much resembling the native Galloway sheep. They appear to be scarcely so strong as those from the Cheviot; but I have seen too few of them, to speak of their success with certainty. When the South-down sheep are crossed with the Merino breed, they likewise produce an animal of a more tolerable shape than the latter crossed with any other. In a word, I have no hesitation in recommending the method of crossing breeds, as the safest of all methods which can be adopted of ameliorating the quality of our wool; and every farmer whose land is capable of producing finer wool than that which he has at present, will do well to consider of it. The Scottish sheep may be crossed with the Cheviot and South-down breeds, and these again with the Merino breed; on the wool of which, a very great advance must necessarily soon take place.

I shall conclude this letter with one remark, which is, that as soon as the fine-wooled sheep are a week old, they are generally as healthy and as hardy as the most coarse-wooled ones, *if once they are naturalized to the ground, and are become natives of the soil.* But the experiment of removing sheep, of whatever kind, from low land to that which is high, or from grassy land to that which is hard, is the most dangerous one connected with sheep-farming; the one by which more money has been lost to Highland farmers than any other; and the one which of all others has tended most to impede the progress of our improvements in the breed of sheep. I am, Sir, your, &c.

JAMES HOGG.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On a System of Bookkeeping for Farmers.

SIR,

HOWEVER important may be the description of new and valuable inventions and improvements in agricultural implements; and

and correct details of the best practices presently known, though but partially adopted, and of the result of carefully executed and well authenticated experiments in husbandry, I am glad to find, by several articles in former Numbers of your Magazine, that you agree with me in thinking, that its pages ought not to be exclusively occupied by these details. This has led me to hope, that you may give admission to a few remarks on what I conceive to be an important *desideratum*—I mean, a system of bookkeeping adapted to farmers—merely with a view to direct the attention of your correspondents to that subject, and perhaps to induce a discussion that may eventually lead to an uniform method and accuracy in farm accounts; which, besides the great advantages that farmers themselves would experience, would produce, in my opinion, very beneficial consequences to the art itself.

I am well aware, that some of your readers will be ready to throw aside the Magazine, or at least turn to a new article, whilst they exclaim contemptuously, 'This is a mere pen-and-ink farmer.' But, though at present I place as little faith in the accuracy of general *à priori* calculations on the expenses and profits of farming as you or any of your readers, it does not to me appear quite impossible to make near approaches to it, if regular accounts were kept for some years, in many different situations.

Be that as it may, what I shall content myself with offering at present, does not require any very deep knowledge of the practices of husbandry, nor indeed of any other art or science. Without such knowledge, it may safely be asserted that a proper method of keeping accounts will be of advantage to farmers, as it has been found to be to all other men of business who have a multiplicity of pecuniary transactions; and your readers must excuse me if I add, what is not less certain, that farmers, of all other men of business, are generally the most deficient in the necessary attention to this (as it might be imagined) indispensable duty.

The last assertion I believe will scarcely be contradicted. In the course of a pretty extensive acquaintance with farmers in different counties of Scotland and England, and those by no means illiterate or indigent,—men who had received a learned education, and whose circumstances were sufficiently prosperous to enable them to dispense with their own manual labour, and even *constant* superintendance of all the *minutiæ* of common operations; yet, notwithstanding all this, and their very frequent and considerable receipts and disbursements, I was convinced that many of them kept no other book of accounts than one appropriated to their sales on credit; and another, containing

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an account of the work of labourers employed by the day, in which the articles were marked by their overseers. It is not meant, however, to deny that there are several intelligent farmers whose books are kept with as much accuracy as those of a wholesale merchant or banker; and it is with the hope that some of this description may favour the public with an account of their methods that I now address you. But the error will not be on the unfavourable side, if it is stated, that the annual profit or loss, and a correct state of his affairs, are not to be ascertained from the books of one farmer among fifty through Scotland. It may perhaps be too justly inferred from the superior education of the lower orders in this country, from which many respectable farmers have had the merit of raising themselves by their talents and industry, that the English farmers are not generally their superiors in this department.

To enlarge upon the advantages of a correct system of bookkeeping to farmers themselves, would certainly be a work of supererogation, nearly analogous to the task of demonstrating what is self-evident. If its general adoption should produce no other consequences than that of relieving them from a most unequal and oppressive rule of assessment to the property-tax, and induce Government to place them upon an equal footing with all other classes, not to mention that it would absolve them from the censure implied in the reasons assigned for adopting that rule, farmers would in many cases be amply remunerated for their trouble and trifling expense. But in truth, I am far from resting my recommendation on this prospect, as the ostensible and true reason for any measure are not always, and I believe not in this case, the same. The too general negligence of farmers, with regard to their accounts, afforded a plausible pretence for distinguishing them by this invidious and unjust anomaly, and the facility and certainty of obtaining the greatest revenue for some years of a lease, by means of this rule of assessment, were powerful recommendations, more than sufficient, in such cases, to supersede any inquiry as to its justice. That this is not conjecture, is placed beyond a doubt, by the clause of the act directing a revaluation after the first seven years, which is quite inconsistent with the alleged difficulty or impossibility of ascertaining the real profits of a farmer, otherways than by a reference to the rent paid to the proprietor. As this is certainly a digression from my subject, I shall only add, that the income of the farmer for the whole period and every year of his lease, is thus admitted to be a practicable subject of calculation. It is no doubt true, that for the last twelve years of a nineteen years' lease, he would not by this method be compelled to pay—not a

tax

tax upon the annual profits of his farm, but upon the return of a capital, often of several thousands, which he had expended during the seven years preceding, though he was then also charged for an income, every shilling of which, and the capital itself besides, went to the land, the landlord, and the treasury.

Though the prosperity of agriculture, and of those who are engaged in that profession, cannot well be considered separately, yet I am of opinion, that, independent of the immediate advantages which farmers individually would derive from a correct system of bookkeeping, there would result from its general adoption, after a few years, many important consequences to agriculture itself. Accurate accounts, kept upon an uniform plan, on farms of every variety of soil, climate, and situation, and under the different modes of cultivation and management, —the preferable advantages of which are still subjects of dispute, —would certainly afford better *data* than any that farmers are at present in possession of, for at least an approximation to a just estimate both of the amount of rent that could be safely contracted for at the commencement of a lease, and of the management that it would be most profitable to adopt. Besides, the amount of capital which any particular farm, and any portion of waste land, would probably require, before they were put into that condition to which the occupier looked forward for his reimbursement and profit, though it certainly could not be determined with any just pretence to accuracy, might be so far ascertained as to deter men from embarking in concerns to which their funds were altogether inadequate, and from attempting the improvement of land which would never repay the expense of it.

I am afraid that even many intelligent farmers will be apt to view these consequences as totally impracticable and visionary. They will observe; That there are perhaps not two farms of any considerable extent, so much alike in point of soil, that their expenses and returns can be the same, even though assimilated in every other conceivable circumstance: That whatever may be the management, a great deal must depend upon the character of the respective occupiers; so that, even upon similar soils, the same rotation will not be equally productive: That if even both these objections should be put out of view, the receipt and expenditure of a farmer are materially affected by the mutability of the seasons; and that the same farm, though under the same management and superintendance, will seldom or never yield precisely equal profits in any two successive years: That the business of a farmer, so totally different from that of a merchant and manufacturer, who are exposed to the variations of the market,

market, and the risks of credit only, can never admit of those accurate calculations which are applicable to the transactions of the latter: And that, in short, any theoretical reasoning, however plausible, which pretends to introduce such method and accuracy, ought to be condemned as calculated to mislead inexperience, and excite expectations which never can be realized.

If it was necessary to obviate these objections, before it could with propriety be recommended to farmers to keep an exact state of their affairs in the form of regular accounts, I readily admit, that book-keeping must to a farmer be both useless and prejudicial. But the truth is, that they do not bear upon the point in any respect; or, if at all, they only prove more fully the advantages of the practice recommended. The more difficult it is to form previous calculations with any considerable degree of certainty, the more necessary it is to preserve on record the results of past experience. It is from these records that it is ventured to predict, that the uncertainty might be diminished, though never completely removed; and that a nearer approach might be made to accuracy in fixing the rent of land, and determining the most suitable course of management upon different soils, and in different circumstances. Surely the amount of rent, and the selection of one course in preference to another, must be presumed to result from some calculation; and if a correct system of accounts for a course of years, upon similar farms, and under the management proposed to be adopted, was accessible to the intended occupier, it would give to his calculations a much greater degree of precision than is at present attainable.

It may also be alleged, that, unless to the farmer himself, or his particular friends, correct accounts would be of no avail as *data* for calculation; because it is not to be expected, that a man's private affairs should be exposed to the view of the public. Certainly not: But a practice by which many were known to be benefited, would soon be imitated by others, until at last scarcely any individual intending to embark in agriculture would be precluded from access to the experience of those who had gone before him. Besides, it ought to be carefully observed, that farmers are not rivals in trade; the loss of one is not the profit of another. Though two merchants in the same line, in a town where the demand for their articles is but very limited, may be both injured by competition, and perhaps one of them ruined; it is quite otherwise with two farmers, however nearly situated, and though their produce is the same. They may assist each other; but the one can seldom or never injure his neighbour with impunity. Indeed the County Reports, and in particular

particular the Treatise on Scotish Husbandry recently published by Sir John Sinclair, not only evince the importance of regular accounts to farmers, but at the same time afford a pleasing proof, that the sentiments of many of them are in unison with those of the writer of this article, by the liberal and disinterested manner in which they have communicated to the public, not merely accounts of their different practices, but detailed statements of their sales and expenses, by which the value of these practices, in similar circumstances, may be ascertained. After such recent examples exhibited by some of the most intelligent farmers in Great Britain, it is unnecessary to add more in recommendation of a practice, the neglect of which, nothing but a degree of ignorance, which is certainly very rare at this time among farmers, can excuse.

But it is not sufficient to point out the advantages of regular accounts to farmers or to merchants;—it is of great importance to both, to be taught a correct system, applicable to their respective transactions; and it is certain, that though there are more than one method well adapted to the business of the latter, in which young men are regularly instructed, the former have no access at present to this necessary branch of education. It is perhaps to this, more than to any other cause, that the extraordinary negligence of farmers is to be attributed. But now, when the agriculturist is no longer an illiterate and indigent rustic, nor his exertions, so essential to the best interests of his country, controlled and enervated by the caprices of feudal despotism;—now, when he has acquired capital, and is in the constant practice of liberally investing it in the improvement of another man's property, it is full time that, among the other branches of learning which he acquires in his early years, he should be instructed how to ascertain, with all the accuracy of which the nature of his profession admits, not only his annual profit or loss, but from what particular sources the one or the other proceeds;—from his culmiferous and leguminous crops, or his grass, whether depastured by sheep or cattle,—and from what different varieties of crop and live stock. For a considerable profit may be obtained from a farm,—and yet some of the crops cultivated—some part of the live stock maintained upon it—may be in fact unprofitable. Besides this, before he proceeds to expend his capital upon the improvement of those poor soils of which a part of every large farm consists in almost every district, he should not only form a probable calculation of the sum necessary to their improvement; but, the length of his lease considered, he should be able to judge whether, after they are executed, there will be a reasonable prospect of reimbursement, with a fair profit, during the remaining years of his possession. Four years

of

of a nineteen years' lease, we shall suppose, are past, and a farmer proposes to improve a field, at the probable expense of 10*l.* per acre, and that four years more must elapse before these improvements are completed, when there will be only 11 years of his lease to run. The solution of this question ought to be quite familiar to his mind;—What must every acre of this field then produce, beyond what it does at present, that in the period of 11 years my capital may be returned with compound interest, and a fair profit for risk and superintendance?

It must not be concealed, that many farmers, and very intelligent farmers too, would make a very indifferent figure in a counting-house. Any system that is meant to be adapted to farmers at large, must therefore be as simple, concise, and perspicuous as possible. Though some general rules might be universally applied, and a certain degree of uniformity of plan adhered to, yet as, for the purposes of the retail and wholesale dealer, so for the small farmer, the grazier or sheep farmer, and the farmer of a considerable extent of arable land, whom I have chiefly in my eye, it might be desirable to modify the plan, without however affecting the principles of the system itself.

I am not insensible of the difficulty of forming a plan of bookkeeping which shall embrace all the objects, and answer all the purposes, which have been already alluded to; and it would be perhaps still more difficult to give to such a plan the attributes of simplicity, conciseness, and perspicuity, so necessary to recommend it to the general adoption of farmers. Yet I do not think it impracticable, nor even improbable, that at no distant period an attempt to realize my theory may be made, and after undergoing perhaps successive improvements, may ultimately prove successful. Nor do I hesitate to affirm, that the inventor of such a plan will deserve the gratitude of every farmer.

Should my expectations on this head prove to have been too sanguine, there can be at all events no doubt of the advantages of keeping correct accounts, in some form; and if these observations should have no other effect than to turn the attention of some of your readers to this part of the subject, my object will be at least so far accomplished. I am, &c.

Banks of the Forth, May 1812. LIN.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the probable Advantages of Fiorin to the Highland Districts of Scotland.

SIR, *Shores of the Western Ocean, 1st January,* 1812.

I was a subscriber to the Farmer's Magazine for the first seven

seven years from its commencement; and after an interval of above four years, during which, for reasons uninteresting to you, I discontinued the perusal of it, I have again returned to it with an avidity proportioned to its increasing fame; I have your four last volumes now before me, neatly bound up to correspond with the former seven. All that I have yet been able to do since they came to hand has been, to glance at several papers from the index; in doing which, I have received much agreeable and important information. I am particularly struck by what is said on the culture of Fiorin grass; a subject which, in my opinion, deserves the most serious and extensive investigation; as holding out a prospect which, if realized, will form a new era in the history of cattle-rearing in the Highlands of Scotland.

After the many failures which we have seen in matters of this kind within these last twenty or thirty years, it is not proper, perhaps, to be very sanguine in a case where almost marvellous things are promised. Yet, the respectable character of Dr Richardson; the plain, unaffected, and confident manner in which he states, not hypotheses or speculations, but *facts*, resulting from his own observation and experience, and at the same time repels the objections which have been started against his doctrine; the very high authorities to which he refers for the truth of his statements; the tremendous responsibility which he has voluntarily taken upon himself in regard to the issue; and the mighty importance of the subject, all speak strongly in favour of bringing the matter fairly and fully to the test of experiment.

That the *Agrostis stolonifera* (called, as appears, in the Irish language, by the generic name of grass, FIORIN, and distinguished in Gaelic by the specific term OLACH) has been cultivated in the soil and climate of Ireland with the success mentioned by Dr Richardson, I am perfectly satisfied, from the considerations already stated: That Fiorin is a plant very common in all parts of Scotland, where it grows on almost any soil, is perfectly well known to every one who can distinguish it from other herbs: And that it is a species of food peculiarly grateful to live stock, and especially to horses, is not only evident from its being constantly eaten down to the ground wherever cattle have access to it; * but is even proverbial in the language of this country, where it is said, as many of your readers

* The mistake of Mr Don (alluded to by Mr Shirreff, vol. xii. 355.) in saying that the *Agrostes* are disliked or rejected by stock, arose from a want of due attention to the subject; and may be traced,

readers must know—' *Miann gabhair gaoth, miann caoire* ' *uisg; miann cait conaphianadh, miann coin sneachd; miann* ' *eich* OLACH,' &c. Literally in English, ' *A goat delights in* ' *wind, a sheep in water; a cat delights in being teazed, a dog* ' *delights in snow; a horse delights in* FIORIN.'

That Fiorin will grow in very indifferent soil, I have the most convincing proof; having seen a plant of it last harvest growing on the top of a heap of Liverpool coals about five or six feet high. By what accident it came there, I know not; but it seemed healthy and vigorous, and was nearly four feet in length, though it could not have lain there above half a year at most, as the coals were landed there from a vessel only about twelve months ago. Whether it grew there from the seed, is not very material. It is proper, however, to mention, that a small clod of earth, in which the plant had evidently been formed, surrounded its roots. At the same time, it appeared, on removing it from its bed, that the small fibres had numerously spread themselves beyond the clod of earth, and firmly attached themselves to the coal, deriving their nourishment from the rain which fell on that unwholesome substance. It is of importance to add, that, in this country, the last summer was remarkably hot and dry; so much so, that corn in many favourable situations did not arrive at the height of six inches. I mention these circumstances as so many inducements towards the attempt of cultivating the Fiorin grass in those districts in which an article of that kind is so eminently needed: For the question is, whether it can be reared in the Highlands of Scotland with the same success as in Ireland? In Low country farms, where winter provision is abundant, the subject is of small comparative importance. But in a country where a man may occupy several thousand acres of hill grass, and not a dozen of arable ground, and where, of course, the difficulty of preserving cattle during the winter and spring quarters is beyond conception great, and the loss, in bad seasons, often ruinous; in such a country, the very mention of a plan by which above half a thousand stones of hay may be raised, at a very moderate expense, on one acre of ground in one year, and on almost any soil, and all that quantity secured in good condition,

traced, on proper examination, to the wise provision which is made in nature for the preservation of these and other useful grasses, by rendering their flower-stalks and seeds unpalatable and insipid to cattle. The strings, however, and leaves of the Agrostis stolonifera, which are intended for food, are no less agreeable, and eagerly sought after, than they are nutritive and wholesome to the graminivorous tribes.

tion, in the most unfavourable seasons, and even amidst the most stormy weather, is animating in a very high degree—the realizing of the prospect will add thousands to the population of the Highlands, and make the name of Dr Richardson immortal. I am resolved, as far as regards the particular spot to which I have access, to put the matter beyond a doubt as soon as possible. But before I proceed on an extensive scale (for I have not much level ground to speculate upon) I request that you will be so very obliging as to inform me, and others in similar circumstances, how we ought to proceed in the management of the plants, so as to warrant a hope of success.

Permit me now, Sir, to solicit your attention to another circumstance which, I am confident, will tend greatly to enhance the value of your most useful publication in many parts of the country where it is already known, and to promote its still more extensive circulation where as yet it is not read. It is, that you would occasionally employ a corner of your pages in giving a description of the most valuable botanical subjects (particularly the grasses) which are treated of in the course of the work, and accompany the descriptions with a plain engraving. The expense, it is presumed, would not be material, and the benefit would be very great, as it would render many admirable papers lately inserted in the Farmer's Magazine (at present, I will venture to say, unintelligible to a great proportion of your readers) clear, entertaining and interesting. All who may wish to avail themselves of your instructions are not botanists, however useful the science of Botany is to the farmer; nor have they botanical books within their reach to resort to: And, consequently, to give your important labours their full measure of intended effect, it will unquestionably be necessary to condescend as much as possible to meet the capacities of the great majority of your readers, who are not philosophers, but plain practical farmers. I should like to see your already very valuable Miscellany arrive at such a degree of perfection, that the farmer, in prosecuting his agricultural labours, should have no occasion to consult any other book, from one end of the year to the other, but the Farmer's Magazine and the great Book of Nature. I am, &c.

ATLANTICUS.

P. S. In one of the Bath Agricultural volumes you will see an example of the particular improvement which I have taken the liberty to recommend; in which the prints are executed in a very neat manner, but perhaps in too expensive a style; and the descriptions are too meagre.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Letter from Mr. ANDREW GRAY, *Engineer, Edinburgh.*

SIR, *Edinburgh, 19th May,* 1812.

A draft, with a description of a Machine for Hummelling Barley and Bear, was transmitted by me to the Right Honourable Sir John Sinclair, Baronet, and published in his recent valuable Treatise on Scotish Husbandry, (Appendix No. VII.) This machine, as stated by Sir John, has been attached to many thrashing mills, and found completely to answer the intended purpose. It has been recommended, therefore, by those gentlemen who have applied it, as a very great improvement; particularly by Mr Young, of Inverugie, near Elgin, and Mr Shirreff, of Kinmylies, near Inverness, who have certified its great utility, in letters lodged with the Secretary of the Highland Society,—and transmitted a model of it, which may be seen in their hall. It is perhaps a proof of its merit, that its invention has been claimed by another mechanic, though, I am satisfied, upon no just grounds; a circumstance that can excite no surprise in the minds of those who have perused the late discussions on an invention of still much greater importance. As the machine, of which a description, with a plate, was given in the Magazine, (vol. xii. p. 226.) is candidly acknowledged not to have been found to answer the purpose for which it was intended, so completely as could have been wished, and as your pages may be read by many who have not had an opportunity of perusing Sir John's Treatise, (though, permit me to observe, it may be read by every farmer in the United Kingdom with much advantage); I am humbly of opinion, that it would be by no means improper to take some notice of this machine in your Miscellany; and that, in this, you would meet the wishes of the worthy Baronet, whose object it is well known to be to give the utmost publicity to every valuable invention in agriculture.

That the account of the machine might be more complete, and not merely confined to such directions as may enable any millwright to construct a similar one, it was intended to state to your readers the expense of each particular part of it,—the quantity of work it was calculated to perform in ordinary cases, with the space it will occupy in the barn, (points upon which a farmer ought to be informed, before he resolves upon erecting one); but as my information on these particulars is not at present so correct as I could wish, I may, if this letter is thought to deserve insertion, transmit it for a subsequent Number.

An

Fig. 2.

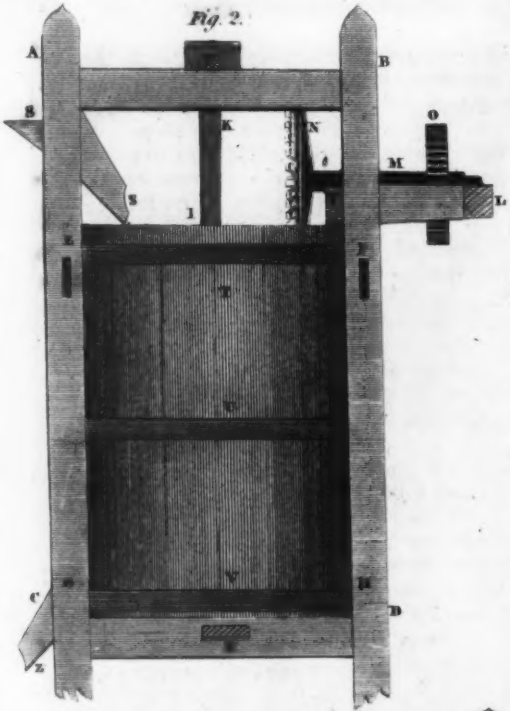


Fig. 3

Fig. 1.

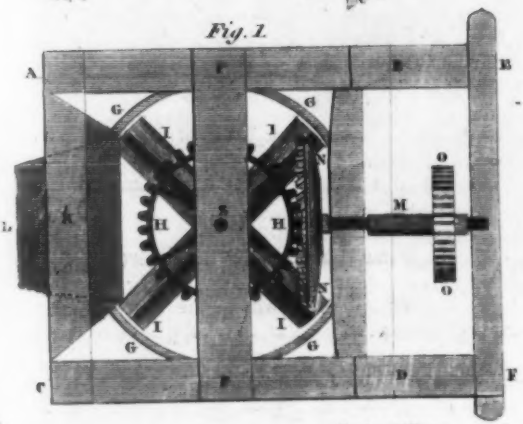
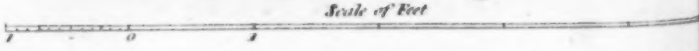


Fig. 4

Fig. 5.

Scale of Feet



Published by Constable and Co

An account of a new method of Yoking Horses in Thrashing Machines, or rather of a cheap and effectual apparatus, which gives to each horse his proper share of the labour, by which it is thought, by those farmers who have adopted it, that five horses are able to perform, and with at least equal ease, as much work as six horses yoked in the common way, and to much better purpose, may probably be offered for a future Number. The inventor of this apparatus, Walter Samuel, blacksmith, Niddry, Linlithgowshire, has been rewarded by the Highland Society, and the Agricultural Society of Linlithgow.

I am, Sir, your, &c.

ANDREW GRAY.

Description of the Machine for Hummelling Barley and Bear, above referred to. Invented by Mr GEORGE MITCHELL, *Millwright at Bishop-mill, near Elgin. With References to the Plan.*

FIG. I. A B C D E F represent the framing that carries the wheels and scutching apparatus. G G G G, a hollow cylinder of wood or cast-metal, into which the bear or barley is conveyed from the hopper K.

H H represent a wheel fixed upon an iron axle or spindle, placed perpendicular in the centre of the cylinder G, and upon this spindle are also fastened the scutchers I I I I; the wheel H is turned by the wheel N N, which is fixed upon one end of the horizontal axle M,—on the other end of which is also placed the wheel O O; this last wheel being attached to a thrashing-machine or any other engine, by this means conveys motion to the scutchers or cutters, I, which revolve in the cylinder G, and clear the grain of the beards or awns as it passes down through among them. (See E F, G H and I K, in Fig. III.)

P P, the cross-rail, in which the upper pivot S of the perpendicular axle turns. L, a spout or opening that allows the grain to issue out of the machine, when completely hummelled, or the beards wholly cut off.

FIG. II. Elevation of this machine, wherein

A B C D represent the frame that supports the different parts of the machinery.

E F G H the tube or receptacle into which the bear or barley passes through the spout S S, from a hopper above the machine.

T U V are hoops of iron to hold the tube firmly together.

I K the perpendicular spindle on which the scutchers and horizontal wheel are fixed, (see C D in Fig. III.) M re-

presents an iron axle, upon which are fixed the wheels N and O, that convey motion from the thrashing-machine to the scutchers. L Y is a frame in which the pivots of the horizontal spindle M turns. R, a rail, that the foot of the spindle or axle I K turns. Z, a spout or opening, through which the grain runs from the scutchers or beaters.

Fig. III. A B represent the spindle, on which are fixed the wheel C D, and also the scutchers E F, G H and I K; these scutchers, revolving in the tube at about two thousand feet in the minute, detach the beard or awns from the bear completely.

Fig. IV. A B C D represent one of the scutchers, and E the axle on which it is fixed; a greater number of scutchers may be placed upon this axle if found necessary.

Fig. V. An end view of one scutcher; its edges, F G, should be a little rounded, to prevent them from cutting the bear or barley in the operation of hummelling.

It is well known that farmers often find it difficult to clear their barley and bear of the awns, and that various tedious and expensive processes are resorted to for that purpose with but little effect, especially when the grain is of a poor quality. There must be some additional stress on the power by which this machinery is turned; but, by experience, that is found to be so trifling, that it may be added to any thrashing-mill, whether driven by water, by wind, or by horses.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Veterinary Art, &c.

Sir,

In France, for some years past, the utmost attention has been paid to the management of domestic animals, and to their treatment, both in health and in sickness. In 1810, under the authority of the Government, a great work appeared, entitled, 'The Universal Dictionary of Practical Agriculture,' comprehending every topic, directly or remotely connected with that important subject; and this has just been followed by two little volumes, under the title of 'Correspondence on the Preservation and Amelioration of Domestic Animals.' I was so much struck with the similarity of France and this happy island, with respect to the diffusion, and use made, of veterinary knowledge, that I thought it would be profitable to your readers to have their notice turned to the subject; and I hope and trust, it will have

have the tendency to rouse them to some attention to the benefits that may be reasonably expected to flow from patronizing that valuable art.

I have the satisfaction, however, to think, that in this respect we are not in a worse situation than France; and though the art has been much more patronized, and at least fifty practitioners in it are to be found there, for one that is to be seen in this country, yet, after all, it appears to meet with the same obstructions, and to be involved in the same fate.

It might be desirable to introduce this subject with observations on the particular state of Animal Medicine in this country; but the length of these remarks precludes this in detail, at present.

The experience of every gentleman who keeps a horse, in this country, affords evidence of the struggle he has to make with vulgar errors, and coarse prejudices, when an ailment befals the animal, and even in his ordinary management during health. The ignorance of stable people is so gross, that their eyes are shut upon science, but open wide to the presumption or quackery of a companion from the forge or the anvil. In France the matter is similar. 'The farrier's principal know-'ledge' (according to the last of the French works already noticed) 'consists in bleeding, whether right or wrong; and most 'of them have one potion *only*, composed of substances that it 'is astonishing to find united, and which they administer as an 'universal cure for all disorders. Their most remarkable ta-'lent is that of securing the favour of ignorant people upon 'whom they have imposed. In infectious diseases, who does 'not see that these people obstruct measures which are only 'effectual as they are strictly and speedily executed? And, in 'common distempers, is it not owing to their influence that re-'gular practitioners are not called till the case is desperate, and 'until the distemper has been aggravated by their improper 'treatment? Calumny is also their favourite weapon;—they 'loudly proclaim every where that the practice of veterinary 'surgeons has been altogether unsuccessful, whilst they arrogate 'to themselves the merit of pretended cures, and carefully con-'ceal the great number of animals that have perished by their 'ignorance or cruelty. In great towns, many wealthy, and 'even intelligent people, allow their groom or coachman to se-'lect a medical adviser for their horses; and these menials are 'careful to employ one of their own rank and companions, who 'flatters and treats them; and who, in the master's account, puts 'down a *sum for the benefit of his employer*. If the issue be even 'fatal, though owing entirely to his mismanagement, it is always

'ascribed

'ascribed to some insuperable cause, which exculpates the farrier. On the contrary, if the master calls in a veterinary surgeon, anxious to do his duty, without regard to any other motive;—on the slightest occurrence, the coachman looks uneasy—his fears are excited—he *assumes* the attitude of distress—and the owner, from confidence or *indolence*, dismisses the skilful practitioner. Thus, gentlemen regularly educated find themselves confounded with the most ignorant and often worthless pretenders, and are found languishing under discouragement and opposition, while their illiterate opponents are acquiring a competence by the most unworthy means,'—at the expence of the suffering animal, and the purse of his owner. Who, that is at all acquainted with the state of this most valuable art, and the reception which it experiences in this country, would consider that this is a translation from a French work of the present day?—It forms indeed a striking picture of what is to be seen here.

It is the bounden duty of the public to protect the regular practitioner; and this would be but following the example set by our venerable Sovereign, who patronizes, by an annual gift, the college under professor Coleman. 'One cannot sufficiently appreciate,' says the French author, 'the talents and labours of the veterinary practitioner; and the more so, as those ignorant people who presume to the management of animals, infuse into the minds of their abused owners, by the most subtle and industrious means, a prejudice, highly injurious, not only to them, but to the public at large.'

Thus does France complain at this moment, and so also does Britain; but it is a curious fact, that in the year 1763, the Earl of Pembroke complained loudly, and almost in the same terms. His work, addressed to his present Majesty, formed the dawn of the veterinary art in this country, and paved the way to that proficiency in horsemanship which renders our cavalry paramount every where, by the establishment of regimental riding masters. The length to which this paper may extend, prevents me from further remark upon the Earl's work, which may be given at a future opportunity.

I shall now only notice one or two circumstances, evincing how negligent farmers are, in the care and management of their valuable horses, that demand serious attention; and the first is, the practice, among farmers almost general, of contracting with their country smiths or farriers for shoeing horses by the year.

Professor Coleman has demonstrated, upon principles clear as noon-day, that a shoe cannot remain upon a horse's foot above twenty-eight days, without doing injury; the smith's object

ject must be to shoe *as seldom* as possible, and with this view it is their practice to weld into the point and heels of the shoes, pieces of *cast iron*, and to place nails all around; so that a shoe, in some instances, is known to have remained on the foot six months, producing a variety of evils which farmers little think of. The foot of a horse has a constant tendency to *increase in circumference*. When it is bound round with iron, this tendency is obstructed; and the solid part of the foot must, of consequence, press upon the inner tender and sensible part, viz. the internal frog, which readily yields to the external force: The moment that such pressure takes place there, is seen by the heels closing, and the clefts of the outer frog filling up; and hence obviously arise lameness, thrushes, and a variety of other evils.

The high heels given to draught horses are also productive of great mischief; they are given to form a stop for the horse; but the frog is his natural stop; and if his foot is managed in the modern manner, by the frog being brought down to the surface of the shoe, it will in all cases, for the fore feet at least, prove a stop sufficiently powerful: These high heels throw the knee of the horse forward; and, of course, prevent the great back tendons from ever performing their office in a perfect manner; they are never upon the full stretch as nature intended, but always loose, and hence without strength. When horses, having these high heels, are suddenly stopped upon a pavement, it may be seen how much their fore limbs are distorted, by the shock which they receive: the knee is seen tremulous for a minute or two, and pain is evidently diffused throughout their whole body. A horse, pulling a draught up an inclined plane, can never exert his full strength, unless his heels, (and frog of course) come full to the ground; the simple observation of a careless spectator will satisfy him of this: But the greatest benefit resulting from the modern plan of shoeing is, that a horse, whose foot has been treated with skill, will suffer no inconvenience from the loss of a shoe, even if he has some miles to travel.

The education of our country draught horses is very defective. After having been handled, (as it is termed), they are put into harrows, plough, and cart. We all see how awkwardly a pair of horses turn at the end of a furrow; how difficult it is for the animals to do so; and how often this excites the displeasure of their driver. The shaft horse of a cart has many a sad and painful struggle to make, when he is compelled either to *turn hastily*, or *upon little ground*; but all this is not the fault of the animal, but of his master, who knows well, in such cases, how often his horses receive incurable injury, and who yet never thinks of making them do better.

The education of every horse should begin in the *longe*; he should

should be made, by little and little, and by the *most gentle* means, to move in a circle; first to one hand, and then to the other. The circles should be at first large, and *gradually* contracted to the *smallest* size. Two grand objects are attained by this: First, his shoulders are suppled, and he is taught to cross his legs readily, so as to enable him, with ease, to turn upon little ground; and next, he learns to lead off with the proper foot, in making these turns; and add to this, his docility is improved. A stiff horse is apt to slip his shoulder when forced to turn upon little ground; and the shaft horse of a cart, carrying round a heavy load with him, is very apt to fall, if he leads off with the wrong foot,—The *longe* teaches him which foot to employ; and, after being so taught, he knows too well the *value of the lesson*, either to *neglect* or *forget* it.

It is proper to observe, before closing these cursory remarks at present, that there has happily appeared in both countries, of late, some disposition, on the part of established farriers, to cultivate veterinary knowledge; or, in other words, to dismiss ignorance, and to banish arrogant presumption, even from the forge and anvil;—which is to be hailed as a deliverance to the poor horse from thraldom and slavery. But let IT EVER BE RECOLLECTED, that this art is not to be acquired in a day; or that, by attending a single course of lectures, all old prejudices and false notions are eradicated—or that a student becomes fitted, all at once, to be an adviser, in a matter now surely of vast importance, by the increasing value of the animal. 'Long study 'and practice are necessary to render men acquainted with this 'art; the public interest requires that his education should be 'general and complete; and government,—after having fostered 'the establishment of the college, and after having interested 'itself in the development of talents in an art hitherto an im-'portant *desideratum*,—Ought it not to adopt such measures as 'may insure to the profession its just claims?'

It is pleasing to observe, that the gentlemen of a particular district in Fife, aware of the importance of a person duly educated in animal medicine, are about to bestow a liberal salary on a young man who will settle among them, independent of what he may derive from his attendance and advice: And several agricultural societies have sent young men to be educated, both to London and Edinburgh, at the charge of their funds.

The French volumes, from which copious extracts have been made, comprize, in the form of letters, valuable information upon the diseases and management of Stock in France; from which I propose, from time to time, to offer further extracts, as well as from the great work first mentioned, if you deem them interesting to your readers. I am your, &c. J.

Edinburgh, May, 1812.

FOR

FOR THE FARMER'S MAGAZINE.

A Traveller's Notes on the State of Cultivation of the Country through which he passed, and the Comparative Earliness and Goodness of the Crops.

Aug. 22. 1811.—From Dumbarton to Glasgow.—We saw several good fields of oats along the banks of the Clyde. The wheat and barley crops were in general thin. We saw some fields of oats a-cutting; but the harvest will not be general for a fortnight.

From Glasgow to Edinburgh by Hamilton and Lanark.—There are many large fields of potatoes in the neighbourhood of Glasgow, which, on light sandy soils (of which there is a large portion near this road) are excellent crops. But where the soil is clay, by reason of the wetness of last spring and summer, the fields are deformed with blanks, and the crops bad. The Highland districts, which we have just seen, now yield a great part of their ground, where they had formerly corn crops that seldom ripened, to potatoes.

The crops are in general nearly an average; and about Lanark, they say they are much better than usual. The corns on some small fields are cut down.

The orchards betwixt Hamilton and Lanark have not this year yielded half their usual quantity of apples and pears.

The country from Dumbarton to Lanark, along the banks of the Clyde, is well wooded, and in general well cultivated and populous. We pass very near the seats, and through the woods and pleasure grounds of the Duke of Hamilton, Lord Douglas, and the Earl of Hyndford, besides those of many private gentlemen, and hard by the great fall of the Clyde, called Stonebyres Linn. It is a ride of about forty miles, that is hardly to be exceeded for beautiful scenery and variety.

Sept. 2. 1811.—From Edinburgh to Berwick by Haddington and Dunbar. Past Haddington half a mile opposite to Amisfield house, saw seventy reapers, with sickles, cutting down a very fine field of wheat; which shows that harvest is seriously begun.

Rents here, said to be about 6*l.* per acre, and the farmers thriving. This demonstrates such a perfection in cultivation, as surprises the inhabitants of the most fertile tracts in South Britain, whose rents are seldom above 2*l.*

In the best cultivated parts of Scotland, every farmer has his thrashing mill driven by horses; which machine is little known in England. In situations suitable, they are driven by water.

water. But here, and in Berwickshire, there are a great many windmills for this purpose; and it is believed the most of them may also be driven by horses when necessary. But, what is perhaps of more importance towards the economy of labour, the plough is of a proper construction, light and without wheels, and drawn by two horses only; in some cases by one. The fields are in general large and open, containing upwards of twenty acres.

A few crops carried home. Passed a fine crop of barley; also a turnip field drilled, and horse and hand-hoed, in a very perfect style, for the advantage of the crop which is excellent, and for the lands which are cleaned nearly as completely as by the best fallow.

Linton.—Fine crops of ruta-baga, as well as turnip, cultivated by a farmer of excellence, Mr Renny. Stubble as clear of weeds as a barn floor. A field of wheat unripe, and very thin. Not so early here, by a few days, as last year; and fourteen days (or more, some say) later than usual.

Elder-berries, bramble-berries, and haws, unripe yet in this quarter.

Good drilled beans. Beans sown in drills, and horse-hoed with care, leave the ground almost as clean as a fallow. Beans are adapted for strong deep soils, while lighter soils are cleaned with a drilled crop of turnips: But still, the East Lothian farmer, viewing the necessity of most accurate cleanness from weeds, has frequent fallows.—Here we saw many fields of fallow well ploughed, and free of roots and greens. The soil seems a loam, or mixture of good earths, of a red colour, the same as most of the best soils in England.

Few orchards in this tract; but there is no fruit on such trees as we saw, the blossoms of the apple trees in Scotland having been mostly destroyed by caterpillars, alleged to have been encouraged by the wetness of the spring.

Fences are of hawthorn, neatly clipt and kept low; and the country here is cultivated as a garden. Good fields of oats ripe on each hand, and some shorn. There are some hedge-rows of

* The farmers here say their crops of barley are not so good as common; and that the wheat, which is thinner than usual, turns out ill-filled in the ear, and worse than its appearance denotes: But, passing along a public road, we can judge from appearances only. The spring and early part of the summer being much wetter than usual, is assigned as the cause of most of the defects in the crops this season; but, for the defect of the wheat in the ear, the East Lothian farmers account, by taking notice of an uncommon high wind when the wheat was in blossom.

of trees hereabouts; but they are not general, as in England. They are very ornamental to a country, and even useful perhaps for shelter to grass enclosures or parks, but are hurtful to corn crops.

Passed Dunbar.—Fine crops of oats, and large fields of good turnips in excellent cultivation. Wheat crops thinner than usual here, but apparently good, and mostly ripe. One field of good wheat with forty reapers, and large fields of good barley. One large field, of upwards of sixty acres, of very fine drilled and horse-hoed beans. Soil good loam, of a red colour.

Six miles.—No enclosures, except stone walls. Perhaps if cultivation were carried to the utmost pitch, and all cattle used or fattened by farmers fed at home, both in summer and winter, hedges and trees, in an arable district, would be considered as wasteful of the ground, and hurtful to the crops, and therefore should be destroyed.

In the immense fertile plain in China, which I think they call Pechelee, and the vale of the Peiho river, where there is no grazing, and no need of fallowing, all crops being drilled, for the sake of ease in weeding, there are also no enclosures of any sort. This is perhaps the highest degree of perfection in cultivation.

On the other hand, where, for the rearing of cattle, or protection against chilling blasts to high grounds, shelter is required, hedges should be composed of evergreen trees; such as firs, hollies, &c. At Dunnichen, the garden of that respectable gentleman, Mr Dempster, is surrounded with a very fine fence of spruce firs. There are many tracts unfit for any thing but trees.

Seven miles.—Fine oats. The oats in general seem a good crop this season.—They tell me, that here the farmers do not permit any gleaners till the crops are carried off; which is prudent, and prevents temptation to pilfering. Where many of the crops are cut down with the scythe, and well raked, as is done in some places in England, there is hardly any room for gleaners.

Pease Bridge has a notable arch 123 feet high. But there is said to be an arch in China 900 feet high.

Pass moor grounds. They need draining. Drainage by ditches, both great and small, is the first, most important, and cheapest improvement of moor lands. The rains that fall on the high grounds creep down into the vallies, and produce bogs and peat mosses, with sour and worthless pasturage, that occasion diseases to sheep and cattle. By drainage, the soil is immediately altered, and the herbage amended, the vallies being kept drier.

Berwick

Berwick on Tweed, to Belford in Northumberland.—The road, for some miles after passing Berwick, is the worst to be seen any where. If a little of the ordinary crookedness, and a little of the soft materials that are used for roads in most other parts of England, were had recourse to here, the defects of this road would be amended.

The crops are yet green, and there is little reaping. The crops are also thin. The fields are here of the size of from thirty to forty acres.

Five miles.—A good crop of turnips, drilled and properly thinned, as the Scots turnip fields before described. Saw a farmer's stack-yard with a dozen of old stacks of corn.

Six miles.—Here is begun to be exhibited a little of that system so much practised on the old English roads, of turning them round in a circle, for the most trivial reasons. The road here is wheeled a mile about, round Sir Carnaby Haggerston's premises. Perhaps if all the public roads in Great Britain were made in the straightest line expedient, without going over hills, the expense saved on the length of the way, in the travelling of waggons, post-chaises and horses, if laid on as a toll, would pay the expense of making new roads in a year or two, and also save many hundred acres of good land.

Seven miles.—The crops are poor and late, and the cultivation bad in general, with crooked ridges, &c. Thorn hedges, on each side of the road, all the way to Belford.

Belford.—Crops green, and but little shorn. The crops about the valley of Belford are in general good, as far as seen from the road, though the cultivation is not of the best sort.

Three miles.—Hedges here, as in many, indeed most parts of England, though seldom seen in Scotland, are composed of all sorts of shrubs and trees; such as white thorn, black thorn, hazel, holly, willow, woodbine, night-shade, virgin's bower, maple, hornbeam, elder, brambles, &c.

Five miles.—Turnips well managed, and a good crop. The other crops very indifferent. All the way from Berwick there are seen only partial clumps of trees.

Six miles.—Turnips good, but the other crops poor. A farmer here says, the crops of grain are hardly so good as usual in Northumberland, especially on heavy lands, occasioned by the rains in spring; and there are very few apples.

Sept. 3. 1811.—Alnwick to Morpeth. No fruit in the orchards near Alnwick. *

Four

* At Alnwick, I measured the girth of a large ash tree in the churchyard, which is 11 feet. But there is a yew tree in Darley church-

Four miles.—Crops poor and green; very little shorn.

Carts now appear of a different construction from those in Scotland, being long and light, and drawn by two horses. The cart, not too heavy, drawn by one strong horse, seems to be the perfection of that machine. A good horse may draw in a cart of the best construction, with wheels unbevelled, on good hard roads, a ton, or a ton and a half weight; and if the draught is over soft grounds, the weight should be proportionally diminished, and the wheels should be broad. The farm-carts and ploughs, as seen in many parts of England, with three, four, five or six great horses in a row, and with two or three drivers, seem an unaccountable absurdity. They seldom do twice as much as a single horse can perform properly attended.

Pass Davidson of Swarland's monument of his own vanity, inscribed, as a tribute of friendship, to the memory of Lord Nelson.

Seven miles.—The country now appears well wooded, with hedge-rows of trees.

Ten miles.—Crops still uniformly almost thin and poor; though the people do not say they are much worse than an average crop. Little barley seen: nothing but wheat and oats. Soil clay, and pasture very bad.

Fourteen miles.—Still poor crops and bad pastures; and no reaping yet, all the way to Morpeth.

Saw a thrashing mill—not common now.

Morpeth to Newcastle.—Three miles on. Crops better, but green. Much liming going on to fallows.—Roads very crooked, and much ground wasted by their being too wide—in some places 100 feet wide—and the sides overrun with furze, &c. It would be worth while for the proprietors on each side of the roads, to get leave to take in these wastes, and either plant them with trees, or make new hedges for enclosing them, in place

churchyard, Derbyshire, which is 33 feet round at a medium of girths of the trunk. I saw this yew last year.—I have been told of a yew tree, near Perth, that is 40 feet round. The late Dr Hunter of York gives a figure of an oak, growing at Cowthorpe, near Wetherby in Yorkshire, which measures 48 feet in circumference at three feet from the ground, and 78 feet close to the ground. But the thickest tree in Britain is a chesnut tree in England, according to the information of the late Dr Hope, Professor of Botany at Edinburgh, which, at a medium, is 50 feet round. And, according to that gentleman, trees in the warm climates of this globe grow sometimes to the enormous circumference round the trunk of 200 feet.

place of the old worn-out hedges, which, it is probable, have been originally made of thorns; but the gaps in them being, from time to time, filled up with brambles, and all manner of unsuitable shrubs and plants, the hedge becomes at length altogether unserviceable; and laziness so much prevails, that it is still continued on in the patching system, instead of being wholly renewed.

Stacks here seem to be too round and flat on the tops, for effectually resisting wetness; but very neatly built. In some places, they appear like globes, and much time is wasted in making them.

Seven miles.—The country is much improved in appearance. Hedge-rows and clumps of trees; but the crops still rather poor and late. The enclosures are of the size of twenty acres and upwards. The turnips now begin to be improperly cultivated, being in most cases neither properly hoed nor thinned, nor are they drilled.

Ten miles.—Some fields of fine oats, which commonly about this place have a mixture of Tartarian with other oats.

Twelve miles.—There are now, as we approach Newcastle, good crops of wheat and oats mostly ripe and a-cutting by a few reapers.—A score of windmills for grinding are now in view.

Newcastle to Sunderland in the county of Durham.—One is properly in England at Newcastle. Here we saw women making mortar, carrying bricks, &c. While it seems savage to employ the more delicate sex in labours that require great muscular exertion, it appears very proper that, as in the metropolis, they should be invited to exercise the ingenious professions of watchmaking, jewellery, &c.

Good crops are seen all along the side of the Tyne, and the people throng cutting them down. The fields in general being from four to ten acres, surrounded with hedges of a variety of shrubs.

Four miles.—A large common, which might be easily improved, but at present covered with furze, and depastured by a swarm of half-starved beasts, geese and swine, and asses, like most of the other commons in England. This calls loudly for a general enclosure bill, or some other remedy; as not the twentieth part of the useful produce of many large tracts of sometimes fertile country is profitably obtained in this way.

Seven miles.—Culture bad. At Bolden, the fronts of the houses of every one are covered with fruit trees, vines, flowering shrubs, &c. as is the case all over the southern parts of England; and the crops, particularly of jargonelle pears, on these houses seemed good.

Eight

Eight miles.—Poor clay soil; foul fallows; bad cultivation, and poor crops.

Saw Sunderland Iron bridge over the Wear; which may justly be considered as one of the wonders of the world. Height above the water 100 feet; spring of the arch 33 feet; span 236 feet; being, as alleged here, the largest arch in the world.

From Sunderland to Castle Eden and Stockton on Tees, county of Durham.—Two miles. Carrying home an apparently good crop of wheat. Good crops in general here, which is near the sea-side. But, as common all over England, the fields are small, and the reapers few. I have never observed in England such numbers of people collected to work in the fields in harvest, as in Scotland.

Four miles.—High grounds, and poor thin crops; but, in general, the people do not complain, but say the crops are as good as usual.

Twelve miles.—Better soil; a thrashing mill; and good turnips, broadcast.

Pass afterwards a high country, and poor soil, till we approach the valley of the Tees, which is beautiful, and mostly subdivided into small paddocks of verdant pasture, consisting of from two and four to ten acres.

Sept. 4. 1811.—Stockton on Tees to York by Yarm, Thirsk, &c. Two miles. The pastures here very green. A field of wheat, thin and short, cutting down by fourteen reapers. Fences of black thorn, which seems a bad plant for the purpose.

The houses in the town of Yarm have a pleasant and rural appearance, from their being universally covered with vines, bearing clusters of all kinds of grapes, with flowering shrubs, as honeysuckle, jessamines, and especially with pyracanthas, or evergreen thorns, ornamented with bunches of deep red berries. Every village now has the walls, even of its cottages of brick, or mud, decked in this agreeable manner; and the inside of their leaden windows show a profusion of balsams, myrtles, and hydrangias in pots.

There seems no taste for this sort of ornament in Scotland, where the desire for neatness and cleanness, in and about the houses, is not much cherished.

Six miles.—Crops in general not heavy. Corns either already carried off, or cutting down with three or four reapers. Turnips, as is generally the case all over England after you pass Northumberland, neither drilled, so as to be horse-hoed, nor so thinned as to admit of the turnips arriving at their largest growth. Indeed, frequently they seem to be neither thinned nor weeded at all; and so are converted into fields for feeding

feeding sheep on their leaves, as the cole, and they are sometimes mixed with cole.

Few apples seen in the orchards; though they are said to be a good crop in the south of England.

Seven miles.—Poor crops of wheat; but the oats are better. Hardly any barley seen in this part of Yorkshire.

Ten miles.—Pass several orchards having very few apples.

The fields are larger here than about Stockton, and the fallows and fields in general are clear of weeds; but the crops are not weighty, though healthy in appearance.

The hedge-rows of trees make the appearance of the country very beautiful.

Geese, pigs and asses are now seen in abundance traversing the roads every where.

Thirteen miles.—A small thrashing mill here; which is a rare sight.

From Cleveland Tontine Inn to Thirsk.—The country is generally, as through the most of Yorkshire, divided into small enclosures of old rich grass for pasture and hay. Those for hay are dunged on the surface each alternate year; and they have frequently the hay-stack, of a balloon shape, erected in the middle of the field, along with a cowhouse: which last appendage shows clearly that it is not intended that the field shall ever be submitted to the plough.

There are here little corn crops grown; but what there are of them are bad; perhaps because these corn crops are a continuation of repeated white crops on the same land.

The roads are very crooked.

At the entry into Thirsk, saw four men engaged thrashing oats in the open air; a practice not uncommon in England, but surely attended with the loss of much corn.

At Thirsk, the landlord says the crops of corn are esteemed better than usual; but that there are few apples and pears in the orchards in this neighbourhood.

Here, I cannot but reprobate the appearance of the stacks of all kinds, which are too round and flat on the top. Most frequently here they are also placed on the ground, without having standards to protect them, either from dampness or from rats and mice. In most places of Scotland, the same slovenly negligence, of having no standards, prevails, to the great loss of the farmer. In other parts of England, where their huge barns are not capable of holding the whole crops, the stacks are built on standards of brick, or of stone, or of wood; and not unfrequently are raised so incommodiously high, as to form shades for their cattle in winter. A gentleman of Fife uses,

and

and recommends standards of cast-iron, which may now be had in every foundery, at the expense of about 3*l.* for each stack. They raise the stack 20 inches, or more, from the ground; and are so effectual, not only in giving air to the stack, but especially in preventing the intrusion of rats and mice, that, in most situations, by the saving in this way, these standards pay their original cost, or more, every year.

(To be continued.)

FOR THE FARMER'S MAGAZINE.

On Fiorin Grass.

[The insertion of the following papers having been, from want of room, as mentioned in our last, necessarily postponed till the present Number, they are here (as then promised) presented for the perusal of our readers.]

Letter from the Committee of the Agricultural Society of Kirkcudbright, appointed to visit Dr RICHARDSON *in Ireland, to* WILLIAM HERRIES, *esq., Preses of the Committee of Management of that Society.*

SIR,

WE have to communicate to you, as preses of the Committee of Management, for the information of the Stewartry of Kirkcudbright Agricultural Society, that we, the undersigning, constituting a quorum of a Committee appointed to proceed to Clonfeckle, the residence of the Rev. Dr Richardson, in the county of Tyrone, to view and report on the result of his cultivation of the *agrostis stolonifera*, or Fiorin grass, did, in obedience to the mandate of the Society, proceed to effect this purpose; and have endeavoured, as much as we were enabled, to discharge the duties thus reposed in us; though we have reason to regret, that we were deprived of the assistance of several other members named alongst with us in the aforesaid Committee. We hope and trust, however, that the Society will make all due allowance, if we in any thing fall short of their expectations, when they recollect that our earlier habits were not devoted to agricultural pursuits; at the same time entreating every member to rest assured, as well as every gentleman in the United Kingdom, under whose eye this paper may happen to fall, that the report is unprejudiced, and its facts of the most accurate and uncontrovertible denomination.—On the morning of Monday the 28th October, the Committee reached Clonfeckle house; when, being favoured with fine weather during the three days we staid in that hospitable and elegant mansion, it was in

our power to examine, in the minutest manner, the whole of Dr Richardson's operations in the cultivation of Fiorin grass, which, in point of extent, amounts to about 15 Irish acres. In this quantity of surface we found a variety of soils, such as deep rich loam—stiff cold clay—thin poor gravel—and bad peat-moss or turf-bog, as expressed in Ireland. In a field of six acres, which had formerly been used as natural meadow, the Doctor began to mow the morning we arrived; and, through the course of the evening on the third day, the crop was nearly all in lap-cocks. The appearance of the whole surface resembled one of our squares of hay gathered for the purpose of ricking; or the expected produce of twenty acres of excellent meadow collected to an eminence, to secure it from the sweeping influence of an approaching flood. And, after the most careful examination, we, in the purest spirit of conviction, feel called on to pronounce, that there was, on that given extent of surface, four times as great a quantity of produce as we ever saw cut from the most valuable meadows of this country. The Doctor's report (in writing) of this field to us is as follows. "That his steward stated to him, in 1808, that unless it was manured, the hay would not be worth cutting; when he determined to lay it under Fiorin. In 1809, potatoes were planted, with nothing but the scourings of ditches, which, owing to the total absence of dung, produced a very bad crop. In December 1809, the strings were laid down, which, in May 1810, produced so unfavourable an appearance, as to induce him to believe that the crop was choked with weeds. In June following, however, he wed it, and cut, during winter 1810, a crop of hay, much of it very good, and all tolerable. There is in this field a great variety of soil, some portions of it consisting of fine deep loam, whilst other parts are of a dry, vapid quality, which had the advantage of irrigation, attempted through a most imperfect measure of execution. The attention of the Committee was afterwards called to a field of thin, poor, gravelly land, partly under irrigation, having the remaining surface top-dressed with ill made compost of unpulverised clay, peat-moss, and a few ashes. A considerable part of the hay was made and carried off; though, from what remained, it was in our power to ascertain that the crop had been most abundant. The next portion of ground we viewed, was where Dr Richardson first commenced his operations, and consisted of an exceeding dry, poor, sloping bank—ill calculated, from its steepness and original poverty of soil, joined to twenty years severe scourging, to produce profitable vegetation of any description. On this field the crop had been cut and carried off; but we have the best reason

to

to believe, from the Doctor's assurance, that the crop was very considerable, and the effect produced, in great measure, by a top-dressing with miserable compost, the larger part of which was lying on the surface in clumsy unbroken masses of stiff clay, though applied the preceding winter.

In the last place, our attention was directed to Dr Richardson's Fiorin culture on peat-moss, and which, we cannot help warmly stating to the Society, gave us the most unbounded satisfaction; in as much as we, from that moment, felt convinced, that through the admirable exertions of Dr Richardson, there is a prospect of seeing, at a period by no means far removed, several millions of acres, presently contained in our most worthless flow-mosses, brought into as productive meadows as the most valuable of the present natural meadows we are possessed of; and all this effected too with so small an expenditure of money, as to afford the tenant an ample return during the currency of an ordinary lease. In this speculation, we consider ourselves as strongly corroborated, and fully borne out, by the spirited and enlightened efforts of that venerable and invaluable agriculturist, Patrick Miller esq. of Dalswinton, who, by his experiments and letters recently published, has gone far to convince the world of the importance and utility contained in Dr Richardson's great discovery of Fiorin cultivation. We sincerely hope, that the laudable example of this worthy character will be followed by many other proprietors, for the purpose of affording the farming interest the most convincing proofs, how easy a matter it is here, as well as at Clonfeckle, to raise the most productive crops on wretched mossy surface, more frequently calculated to deprive our animals of life, than to contribute to their support and comfort. On this score, the Doctor afforded us the most entire satisfaction, by pointing out the surface of a bog, cut for fuel for ages back, down to so late a period as April 1811, when he brought it under Fiorin. Our gratification was here complete, as the quantity on this miserable surface was truly immense, many of the strings measuring 11 feet 6 inches; and this amazing mass of vegetation produced at the moderate expense of levelling the surface, spreading the strings, and covering them very slightly over with a mixture of peat mould and ashes. A certain quantity of this meadow, Dr Richardson intends reserving for his own cows, as green food during winter; and another portion he proposes to reserve uncut till March or April, for the purpose of ascertaining the Fiorin's power of vegetation during the winter months. Having thus completed our survey of the culture of Fiorin grass in the field, the Committee were, in the next place, brought into the

stables and cow-houses, where experiments were made on a variety of cattle, by giving them Fiorin and natural hay of the best quality; when, in the most decided manner, and without any exception, we ascertained the preference to be in favour of the *agrostis stolonifera*. As Dr Richardson cultivates neither rye-grass nor clover, we had it not in our power to know the result by a like comparative experiment. In the lawn were several ricks of Fiorin, and natural hay, put up on the most luxuriant pasture; and we there saw the foundation of all the Fiorin ricks almost totally consumed by a flock of large Southdown sheep, whilst the natural hay, as also the abundantvegetation under their feet, lay altogether neglected. Of the superior quantity and quality of the milk produced from the Fiorin food, we were equally well satisfied. Every evening there were three basons of milk brought in, with proper tickets under them, to distinguish what was from Fiorin, mangel wurtzel, or natural meadow hay; and we do not hesitate to say, that we were perfectly able to point out the Fiorin bason, from the superior quality and colour of the cream, while the mangel wurtzel certainly held the second place. From the able manner in which Dr Richardson has set forth the qualities of this most valuable grass, it would certainly be improper in us to say any thing farther in a general sense; however, as the Doctor was unacquainted with the process of paring and burning, through the medium of the push-plough, till he saw it effected on the estate of Mr Boyd at Merton Hall, we consider it not out of our province to say, that he highly approves of the measure, as best calculated, at small expense, to free the soil from weeds, and furnish ashes, a manure superior to lime. In this matter it must always be understood, that previous to the strings being laid down, the ground should be always ploughed, delved, or otherways pulverized, so as to render their results favourable. Having advanced thus far in our observations at Clonfeckle, we must now use the freedom to recommend, in the strongest terms, the cultivation of Fiorin grass, to every member of the Stewartry Agricultural Society, as it affords a description of food, which enables the farmer to keep up his system of soiling (the most valuable of all others in a country like ours) from the end of September till the strength of season return with fresh abundance and variety.—Ere we conclude, we, for a moment, beg leave to call the Society's notice to that day which gave birth to the Committee's mission to Clonfeckle, and which, we have strong reason to believe, will be long remembered, with the liveliest pleasure, by every member then present;—in short, when we were honoured by the visit of Dr Richardson, the discoverer of Fiorin cultivation, and that too

of

of John Christian Curwen, Esq. of Workington Hall, whose name, we trust, will meet with the reverence and respect it merits, as long as corn whitens, or turnips grow green, in the British islands.

On that day, after Mr Curwen had concluded his very able speech, the venerable father of the Fiorin gratified the Society with a most instructive address on its cultivation, at the close of which he invited a deputation from our body to visit him in Tyrone, when he kindly promised to convince us, that hospitality was by no means confined to our side of the narrow sea. This most worthy character certainly did perform his promise in the same ample manner, as he has in our opinion, in all other matters, fulfilled his engagements to the agricultural world. In truth, we were more than half inclined to believe, that the Fiorin, with its various other good qualities, possessed the power of generating *the milk of human kindness*, as the Doctor and his amiable family, his visitors, and domestics, used every effort to make the Scottish strangers happy; and thus rendering our days at Clonfeckle among the happiest in our lives.

EDWARD BOYD.

November, 21st, 1811. J. M. M'CULLOCH.

Letter from Dr RICHARDSON, *of Clonfeckle, Ireland, to* W. HERRIES *Esq. Preses of the Committee of Management of the Agricultural Society of Kirkcudbright, containing Observations on the preceding Report.*

SIR,

I return you many thanks for the sanction you have given to the very favourable report made of me and my Fiorin, by publishing it, under the authority of your most respectable Society.

Your committee are pleased to express themselves in flattering terms, upon their treatment at Clonfeckle:—I must remind them, that I came to their country an utter stranger (England, not Scotland, being the object of my journey); that I had neither an acquaintance before me, nor an introductory letter.

Yet, from the moment the spirited and extensive agricultural improvements of Mr Boyd tempted me, from a wish to be acquainted with the proprietor, to drive up to the door of Merton-Hall with a ticket in my hand, I was no longer a stranger; nor, except at Portpatrick, was I suffered to enter a Scots inn; and on my return the carriages of my new friends were my chief conveyance.

Mutual

Mutual kindness, I hope, will lead to more important services. From your superior agricultural skill I have derived valuable lessons, which I hope to repay, by making you still better acquainted with Fiorin grass,—a vegetable singularly adapted to the parts of Galloway and Dumfries I passed through.

As we travelled, I could not help pointing out to my companion, whether Mr Curwen or Mr Boyd, the facilities of Fiorin culture your extensive *peaty moors* afforded; and I do not hesitate to pledge myself, that from Carlisle to Portpatrick, there is not an acre of moor which I could not convert, on very moderate terms, into better meadow than any now in Scotland; and I have sanguine hopes that I may live to see your wish fulfilled, when, expressing your gratitude to your Committee for the patriotic spirit which induced them to take so long a journey, to serve the best interests of their country, you say with confidence, "you trust ere long their labour will be rewarded, by the general cultivation of Fiorin through the waste lands of Galloway."

Though I feel infinitely obliged to Mr Boyd and Mr M'Culloch, for the sanguine manner in which they express themselves of every thing they saw at Clonfeckle, in the Fiorin line, I think the purposes of their mission will be better fulfilled, and the value of Fiorin better understood, by the illustration of a few passages in their able Report.

My inspectors strongly recommended Fiorin grass, as it affords a description of food which enables the farmer to keep up his system of soiling (the most valuable of all others in a country like ours), from the end of September, till the strength of season return with fresh abundance and variety.

I entirely agree with your Committee on the great advantage of the soiling system, which you carry on in Galloway to an extent unknown in Ireland; and happy to cooperate in it, much more effectually than our friends are aware of: For while I refuse to suffer Norfolk to cut a perch of their Fiorin before November, I answer for supplying Galloway with a rich and abundant fleece, from the first of September.

The reason of the difference is obvious; for in the parched sandy soil of Norfolk, the Fiorin will barely preserve its existence through the dry summer months, reserving its rush of vegetation for the moist autumnal season,—and of that it must be allowed sufficient time to acquire luxuriance.

But in the Galloway moors, where, by the aid of its favourite manures, ashes and running water, you can call the powers of Fiorin into action by an early period, you can also avail yourselves of its luxuriance at an early period.

Your

Your Committee dwell much on the extraordinary produce of a particular meadow of mine, which they saw mowed. "Part of this field (they say) was of a dry, vapid quality, which had the advantage of irrigation."

I remember calling the attention of our friends to this spot (while the mower was cutting it), as affording a striking instance of the aptitude of Fiorin for any soil; but they mistook me when they supposed its luxuriance was produced by irrigation, for in fact the place was some feet above the level of my water.

The history of this knoll may not prove uninstructive. It contained about a rood and a half; was a dry weak soil, mixed with a dead sand; it lay in a moist field, always used as meadow, for which this part was very unfit: I have, therefore, twice in twenty-five years, strove, by slight soiling, to extract crops of oats from it; but, finding them miserable for the last eight or ten years, gave it up; mowing a poor crop in a wet season,—and in a dry one leaving it uncut, to be eaten with the aftermath of the meadow.

In 1809 this spot was potatoed with the rest of the field, and in December laid down with Fiorin: In 1810, it gave me a tolerable crop, far better than ever before; after which I gave it a light dressing; and, in 1811, the magnificent fleece, which astonished your Committee so much.

The gentlemen state, "that I propose to reserve a portion of my meadow uncut until March or April, for the purpose of ascertaining the Fiorin's powers of vegetation through the winter season."

In fact, I have, for some years past, sufficiently ascertained the uninterrupted vegetation of Fiorin through the brumal months; and at this moment (December 16), my uncut Fiorin is in as full growth as it was in August. My reservation of three acres of Fiorin until February, March, and April, is for a much more important purpose.

The extent of your Galloway moors, inapplicable to any culture but Fiorin, is immense; hence, when reclaimed, your crops of hay must be of unmanageable magnitude; of course, it must be of great importance to lengthen the period in which your hay can be cut and saved.

With a view to this object, I have, for three years repeatedly, established (on a small scale indeed) the practicability, and facility, of saving Fiorin hay through all the spring months. I am now prepared to try the prudence of the measure on a larger scale; and shall therefore mow an acre in each of the months of February, March, and April.

I shall reserve the important subject of Fiorin hay-making for another

another letter, which I shall take the liberty of addressing to my kind and venerable friend Patrick Miller, Esq. of Dalswinton, to whom your committee gives such high and well-earned praise.

Mr Miller has informed the public, that he will soon have 220 acres under Fiorin, of which great tract every acre must be mowed.

The prospect of such an immense hay harvest (especially as Fiorin is so very productive) must be alarming: but I shall convince my worthy friend, that, great as it may be, he will not find it unmanageable; and that whatever quantity of cattle he may chuse to maintain, their number need not be abridged, from apprehension that difficulties will occur in saving and preserving sufficient quantities of fodder for them.

My Galloway friends know well how to appreciate the value of animal manure; and, of course, it must give them great pleasure to hear, that, while a vast increase of provender, by enabling them to feed a much greater stock of cattle, must give a proportionate increase of dung, I shall not call for one ounce of it to keep up their new meadows: they shall consign it all to their other agricultural purposes, while their fiorin meadows will be regenerated and extended, by the sole aid of the manures which your peat bogs and moors afford in inexhaustible quantities—ashes and running water.

Your friends "regret that they were deprived of the assistance of several other members named along with them in the committee."

I, too, lament that I was deprived of the pleasure of Mr Herries and Mr Douglas's company; and, having flattered myself with the hopes of seeing them, felt a sensible mortification on finding the committee alight without them.

The loss, however, may be repaired, and, I expect, advantageously. The inspections which have hitherto been held upon me, were either in autumn or winter: Spring remains pregnant with new matter, and questions highly interesting to Galloway.

In spring I shall be again found busily engaged with my hay harvest; and your committee will report upon the practicability of maintaining your stock in that pinching season, upon fodder greatly increased in quantity,—I hope not abated in quality; and brought to them without having incurred any expense worth notice in saving.

Irrigation is a serious object in Galloway, where many of your moors, and the skirts of all your heathy and peaty mountains, are commanded by upper rills.

In

In spring, your second committee will find me also in the full process of irrigation, in different places; and I shall show how easily and cheaply I carry on the operation.

They will report upon the style of green food my milk cows are living upon, late in the season; and they will be taught how to know Fiorin at a period when it is not so easily distinguished as at the end of autumn, and more likely to be wanted.

Let me then entreat the Committee of your Society to resume their functions in spring, and particularly enjoin their recreant members to do their duty; and when they arrive, shall I find Mr Herries and Mr Douglas among them, I will forget former peccadilloes, and receive them as I should have done in October, had they (according to promise) accompanied Mr Boyd, Mr M'Culloch, and Mr Scott. W. RICHARDSON.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Construction of Machinery, applicable to Embankments of Rivers.

SIR,

I reside in a part of the country where some considerable streams pass; and along the margin of these, there is, generally, a tract of very fine haugh land: a considerable proportion of this land is embanked from these waters, with tunnels under the bank, to empty the ditches; and the banks are high enough to prevent the water going over them. Notwithstanding, the crops on this ground are always bad; as, owing to back water from the river during floods, or even, where this is prevented, the river is so long of falling, that the land water within the bank injures the ground extremely. I am unacquainted with machinery; but I should imagine it possible to construct a wheel on the inside of the bank to raise the water from a ditch, over the edge of a board fixed in the bank; which wheel to be drove by a machine of a cheap construction. The first expense would be nearly the whole; as it would require to be worked, only when a flood was in the river, and which does not occur more than three or four times in a year, generally.

I have attempted a rough sketch of what I apprehend would answer; but as it has not been tried, it may be unnecessary to present it to your readers. If any of your friends will be so kind as to give what information may be of use on the subject, (through your valuable Magazine), it will be very obliging, and, I apprehend, of advantage in many parts of the country. Where there are banks on both sides of a river, supposing the river to

be thirty feet broad, or nearly so—Could a wheel be erected, to rest on the top of said banks, to be wrought by the stream, and to drive a small wheel on each side of the bank, to raise the water from the ground on both sides the river?—A person attending the while, could perhaps raise and let down the said wheel as the river rises and falls. If this is thought worthy of a place in your Publication, I will attempt something on another subject of rural economy soon. I am, respectfully,

Stirlingshire, 2. March 1812. T. N.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Dubb-grass of Hindostan.

SIR,

Having seen, in a former Number of your Magazine, some remarks, comparing the grass in Hindostan, called the Doob or Dubb-grass, with the fiorin, I cannot pretend to say whether it is the same with the fiorin; but by the description I have had of the Doob-grass from a relative of mine, who was superintendant of a great establishment in Bengal, for the improvement of the breed of horses and cattle, I am inclined to believe it is of the same species. He describes the doob-grass as a long jointed grass, extending along the ground in marshy places, sending forth suckers from each joint; and the mode of propagating it by the natives is by cutting it in joints, mixing them with clay or earth, and plastering them on the soil. He observes, that it is excellent food for the colts; and in very dry weather the natives pull it up, and, after washing it, give it as food to the brood-mares and colts. He adds, that, next to the Guinea grass, he found this the most valuable. The Lucerne he cultivated on a very large scale, and found it of great use. The horse-dealers from North Persia told him, that the Lucerne was the chief natural grass in those places which they considered as the best pasture for horses. Yours,

Edin. May 1812. R. F.

[The writer of the following interesting paper has observed, in his private letter, what we had previously noticed, that it has been already inserted in a London Journal. Anxious, however, to give every degree of publicity to his Queries, and conceiving that many of our readers may not be in the practice of perusing that Journal, it is in compliance with his

particular request that we now give it admission here. In terms of his concluding paragraph, any communications on the subject, post paid, addressed to the care of the publishers, Messrs. Archibald Constable & Co. Edinburgh, will be gratefully received.]

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Turnip Beetle.

SIR,

It were an act of supererogation, to enlarge, in a publication devoted exclusively to agricultural pursuits, on the great importance of the discussion that this address is intended to provoke and elucidate.

Through the high estimation of your admirable and scientific Magazine, I may confidently seek for support in this investigation, both from the enterprising agriculturist and enlightened naturalist.

All attempts either to prevent or destroy effectually the insect, commonly denominated the *Turnip Fly*, have hitherto been abortive. The fallacy of every plan, as yet suggested, is lamentably proved by the disappointment of each successive year. The expense and the anxiety attending these endeavours, and the enormous losses which the cultivators of turnips have sustained from the depredations of this enemy to vegetation, are real national evils.

This plant has now been cultivated, in England, for near two centuries; and, during the whole space, authors have complained of the Fly, as the most formidable foe to its prosperity. In proportion as the value of this root is esteemed and encouraged, the more is the necessity for some efficacious remedy felt, and its want deplored. The mischief is assuredly extending; and all the ingenuity of man has been in vain exerted to check its progress. The experience of the past ought to have long since impressed us with the fact, that, if we are desirous to seek a radical cure for the disease, we must discover other means than those at present practised.

The farmer complains, with truth, that all his cares and labours are often defeated by birds, reptiles, or insects. Yet how is he to appreciate the good, or to avert the injuries, occasioned by those dissimilar animals, but by being correctly acquainted with the natural history of each? If he be solicitous to unfold the secrets of Nature, he should explore her inmost recesses, by well arranged experiments and by patient research. He should

study the constitutions, transformations and habits, nay, the very propensities and antipathies of the lowliest insect, ere he dare expect to circumvent or counteract those impulses which are the dictates of all powerful instinct.

To trace the causes of our misfortunes to their spring, is the surest way to avoid them in future, and, sometimes, even to convert casual ills to substantial benefits. The primary and leading step towards perfection in any science is to remove prejudices.

If we designate any creature by a name which belongs to a quite different being, we perpetuate error, because, it confounds the characters and properties of one class with those that attach properly to another class. Thus, the insect, which is the present object of inquiry, is not a *Fly*, but a *Beetle!* It is, according to *Linnæus*, of the order *Coleoptera*, and of the genus *Chrysomela*. Of this genus Naturalists arrange numerous species; some of them are exceedingly minute and beautiful, from the diversity of their colours.

As the characteristics and habits of Beetles and Flies are essentially different, it becomes indispensable to confer a distinctive appellation that may be familiar in the common language of husbandry. The *Turnip Beetle* appears most appropriate; for the Turnip has many other enemies among the herbivorous insects; of these, several are real flies, either in their perfect winged form, or in that of their *larva* or caterpillar state.

As the subject is of the deepest interest to the whole community, I entertain a very confident hope that this invitation will be conducive to active and general investigation; and that it will stimulate every farmer to direct his attention, during the approaching turnip season, to the various points to which the queries lead. From their answers, connected with preexistent information, we may deduce such useful practical inferences, as will enable us to unravel, eventually, that mystery in which the matter is now involved; and to establish, finally, a more successful system for the culture of the Turnip.

It will be seen, that many of these questions are retrospective, and, where they can be so answered, it will forward the investigation: But they are likewise prospectively applicable; and it is to the future I look, chiefly, for more accurate information in most of the points to which I have taken the liberty of directing the attention of the practical farmer.

1. Which years have been most remarkable for the ravages of the *Turnip Beetle*, and which was the last?

2. Have ever the same fields been before infested?

3. Were the seasons of infection noted as being particularly favourable or unfavourable to the preparatory fallow?

4. What has been the course of crops?

5. What was the nature and depth of soil; and what the subsoil of the field so affected; and what their aspect,—east, west, south, or north?

6. Were they sheltered by trees or high fences on either side; and which?

7. Are they on a hill or in a valley, a descent or level ground?

8. When, and in what manner manured; the quantity per acre; the quality, viz. long or rotten dung, compost or lime, &c.?

9. How many ploughings had the field? And how soon after the seed-furrow was the seed sown?

10. Was any top-dressing used; of what nature, with what view, and what the effect?

11. Were the seeds steeped, and in what preparation? Were they all of the same year's product, or of different years?

12. Were they sown by drill or broad-cast? And on what day of the month?

13. What was the state of the weather? Was it hot and dry, warm and showery, rainy, &c. &c.?

14. In how many days after sowing did the plants appear?

15. At what hour, and on what day of the month, did the *Beetles* appear; and how soon after the plants were up?

It would be desirable that the condition and changes of the weather, and the temperature of the air, from the sowing of the seeds to the first appearance of the *Beetle*, should be stated with as much precision as possible; and, for that purpose, an exact meteorological journal should be kept, from the sowing till the plants are in the rough leaf and out of danger of this enemy: and it is particularly requested that, on the first appearance of the insect, the height of the barometer and of the thermometer in the open air (and the latter instrument being *out* of all shade) about two o'clock of the same day, should be carefully registered and reported.

16. Did the *Beetles* appear at once in different parts of the field, or to commence their career at one particular spot, and advance progressively to others? And whether in any determinate line, or diverging indiscriminately?

17. Upon an average, what time do they occupy in clearing an acre of turnip plants?

18. Patches are often observed to escape and flourish. Can this be ascribed to any thing in the nature of the ground? Is it there more springy; do trees or fences shade it from the sun's

direct rays; has the dung fallen thicker there; or, in the spreading, have these patches been missed?

19. Have the same true *Turnip Beetles* ever destroyed more than one crop in the same season? If so, state the facts.

20. On what evidence rests the opinion that these *Beetles* are migratory?

21. Have any other vegetable crops been destroyed by this *Beetle* in a manner similar to turnips?

22. What methods have been employed to prevent or destroy them, and what has been the result?

23. When the crop has been entirely devoured, and no means used to kill the Beetles, have their dead bodies been found in any considerable numbers on the field?

24. Have their origin, natural dissolution, or departure, been so accurately attended to as to be explained from actual personal observations?

25. What is the natural history of the *Turnip Beetle* (the *Chrysomela saltatoria*, or the *leaping Chrysomela*)? What are the periods of its metamorphoses, its habits, &c. &c.; and what author gives a particular account of this insect?

26. Are early or late sown turnips most in danger?

Further to facilitate my views, I request your permission, Mr Editor, to allow all letters (postage free) to be directed for me at your office. But, as all reasoning must be untenable, unless it be supported by well authenticated facts, I entreat those gentlemen who favour this with replies, to subscribe their real names and places of residence, to whom I shall have no objections to communicate mine in return. Of course, they will be respected as private communications, if so requested: and not published till a proper arrangement of the whole evidence is digested; when the result, if worthy, shall be submitted to the public. On such occasion, I shall take pleasure in acknowledging all obligations. I am, Sir, your obedient servant,

G. M. B.

London, April 1812.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Advantages of Liming Coarse Pastures.

SIR,

I have often thought that great improvements might be made on the upland pasture ground of this and other counties, where nature has placed limestone and coal so near the surface,

and consequently of easy access at a cheap rate. Were the storemasters and their shepherds, in the summer time, when they have almost nothing to do, to exert themselves, they might, with the help of a good quarrier, raise and burn as much limestone, as, when slacked, would amount to a thousand bolls; and thus, every year, give a sufficient dressing to thirteen or fourteen acres of pasture ground. If it was laid upon soft ground, whether covered with heather, bent sprits, or other coarse herbage, the sweet grass that would rise would truly astonish them; and in a very few years the lime would completely extirpate the heath and the other rubbish, and the ground would soon be mixed with fine white clover. About five years ago, upon as many acres of soft ground, all covered with heath, rushes, sprits, bent, and other coarse grasses, I spread about four hundred bolls of floury lime, hot from the kiln, in the month of September; and by next spring, I saw a visible improvement upon the grass. The second year my cattle fixed most greedily upon it; and they are now so fond of it, and other land that I have treated in the same manner, that, when left to themselves when feeding, they will march it to a yard; the greatest part all mixed with sweet grasses and white clover. Even where it is deep black moss, and nothing but heather grew, the heath is eradicating, and various grasses rising; but as I am no botanist, I cannot give you their names. I likewise laid lime upon a hard gravelly soil, where nothing but heather grew; but having little to operate upon, it had little effect. But there are few farms that have not plenty of clay, or some heavy soil upon them. A good compost midden, made up of such soil, well mixed and twice turned over, so that it may be the more equally laid on—if liberally spread upon such land—would amply repay the storemaster and his shepherds for their labour, when situated as above.

About twenty-three years ago, the late Admiral Stewart purchased the property that belonged to the Earl of Loudon in the parish of Muirkirk, as also the property of some small heritors in that parish and in the neighbourhood. He was much attached to Ayrshire; and immediately began some very extensive improvements, by planting, enclosing, and liming his land: But, unfortunately for that part of the county, he was cut off when these improvements were in their infancy; and I am sorry to say, where so much may be done, that I see no appearance of their being renewed.

The land that was in his own possession, was partly let by public roup, from year to year. An acquaintance of mine took a park of about thirty acres, moss land, all covered with heath,

that had been properly limed, for the low rent of five pounds fifteen shillings; and I have often heard him declare, that with all his industry, his profit was only the grass of a year-old colt for eight or ten weeks. For a number of years he annually took this grass park, till it rose to twenty-six pounds a year, and would willingly have given thirty for it, had he not been unfairly treated. At that rent he had three times the profit he had at the first; but by that time the heather had totally disappeared, and was succeeded by a great flow of rich grasses, (and one year it was thick covered with the bandweed). As he did not keep an exact account of the cattle that pastured upon it, I cannot give you the number. I have often seen them, and it was truly astonishing: Yet few in all that neighbourhood have followed the example set before them. Though I know farms on that property where lime can be raised for sixpence or eightpence per ton, with plenty of coals within twenty minutes walk of them; yet they dry peats for fuel, and never lay one handful of lime upon their land; which now looks like a waste.

There are many store farms far from either lime or coal, where the plough has never been used, and perhaps it is very proper it should not. The only method they have of raising fodder for the small number of cattle they keep, is by spreading the dung they collect through the year, over a piece of the best ground they have for that purpose: Were they to ferment moss with it (of which they generally have plenty), according to Lord Meadowbank's plan, they might triple the quantity, and by that means greatly increase their pasture ground. It is true, the cow-dung in summer is very thin; but they seldom want rushes, sprits, or other coarse herbage to mix with it. But shepherds 'canna be fashed;'—their indolence is proverbial.

Yours, A PLEBEIAN.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Sketch of a Plan, pointing out the Days on which the Fairs and Markets of Scotland are held, and describing the Nature and Extent of the Business done at each of them.

SIR,

I observe a question in your Magazine, No. 49th, wishing to know in what manner the days on which cattle and other markets are held, could be more clearly ascertained. I have had that subject in contemplation for a number of years, and ought to have given the writer of the Edinburgh Almanack my

ideas on the subject, but hitherto have neglected to do so. Having formerly had occasion frequently to attend cattle markets in the north of Scotland, I was often at a loss to know in what county the places, where the fairs which I saw advertised to be held, were situated, and not less so to know what business was done at these fairs,—whether in cattle, horses, toys, &c. The following method, in my opinion, would be clearly understood by strangers, and might be useful to the public in general.

I would first take the counties in alphabetical order, and, under each county, and in the same order, specify the towns or places where fairs, trysts, or great markets are held, mentioning the day upon which they commence, how long they continue, the nature of the business transacted at each, and the usual extent of it. It would also be of some advantage to strangers to know the distance of the place, where the fair or market is held, from Edinburgh; and perhaps, some other short notices, as the case might require, might be subjoined.

That my views on this subject may be distinctly understood, let it be supposed that the fairs in the county of FIFE, for instance, are to be enumerated and described. From what I have suggested, every town and place in that county, where fairs are held, must be arranged in alphabetical order, either in the more concise form of a table, or at greater length, in some such way as the following.

Auchtermuchty, miles from Edinburgh.—*April*, first Tuesday, old style, for cattle, horses, sheep or hogs; or for hiring servants, sale of pedlery, &c. (as the case may be)—very considerable numbers of cattle are usually shown at this fair—or, chiefly for hiring servants; but a few sheep and hogs, and a great deal of pedlers' goods are commonly disposed of.—*July*, 13th day—A considerable fair for cattle.—*August*, 21st day—A horse fair, but has been inconsiderable for some years.—*November*, first Tuesday—A fair for pedlery, hiring servants, sale of toys, &c. This fair is well attended.—It is needless to repeat, that these remarks are only suppositious, for the purpose of exemplifying my plan.

After thus describing all the fairs through the year, that are held at Auchtermuchty and other places, it might be proper to add the day of the weekly market of each town (if there is one), and notice whether there is much or little business done at it.

When all the places in Fifeshire, beginning with the letters A, and B (if there are any), have been gone through, the fairs of Cupar, Crossgates, &c. will fall to be described in the same manner. And when the fairs of every town in Fifeshire, throughout the year, have been enumerated, take the next county in the order of the alphabet, and proceed in the same manner.

This plan, in my opinion, would accurately point out the si-

tuation of the places where fairs are held, and the nature and extent of the business done at them. How far it may be practicable to lay aside the old style, I cannot say; the old charters of fairs go by that style. Perhaps the Magistrates of every county might appoint some person to make the necessary calculations, wherever the days of holding fairs are variable and uncertain, and fix on certain days of the month by the new style, in all time coming; which would undoubtedly be a great improvement.

Perhaps your readers may consider the information, which it is the object of my plan to communicate, as not unworthy of a place in your widely circulated and valuable Miscellany. By looking into any Number of it, they would thus be correctly informed what fairs and trysts were to be held in every county in Scotland for the ensuing three months. There can be little doubt that your numerous and intelligent correspondents would cheerfully communicate the necessary information; and indeed it would be their interest to do so, as they would obtain, in return, what might be equally useful to them.

If you think this hasty, and I fear inaccurate statement, will be of any service, you are at liberty to insert it; and any other information I am able to communicate, shall be transmitted with pleasure by, Sir, your, &c.

May 1812. R. H.

The CONDUCTOR requests the attention of the Correspondents of the Magazine to the preceding letter; and solicits them and others conversant with the subject under consideration, to favour him with their sentiments on the plan proposed in it.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Application of Bones as Manure to Land.

SIR, *Edinburgh, 1st June,* 1812.

The country around this city, for some time past, has exhibited a new scene of industry; every field being covered with women and children, gathering bones. The multitudes engaged in this labour, induced me to inquire as to the use that was made of them; and I soon found that the bones collected, which were of every description, and of every animal, either fresh, or those rendered carious and spongy, by age, or damp, were shipped at Leith for Hull; that the uses to which they were applied were for knife-handles, button-moulds, and *manure*. From the *kinds* of bones collected, I was satisfied that for the *latter* purpose the greatest part must be destined; and accordingly, it became necessary to direct further inquiries at Hull.

Having only this day received the information wanted, I can

do no more at present, than request the attention of your readers to this most important fact, and to the consideration, that farmers, with their eyes open, are allowing a valuable manure to be taken out of their hands; and suffering themselves to be deprived of an article which (though it forms a nuisance in almost every corner here) is meant to be converted to a valuable purpose elsewhere. This trade is not confined to the environs of Edinburgh, but is widely extended. All the carriers from remote districts, who have at no time much loading to town, now drive a profitable trade in it, as will be seen by the annexed statement.

At Hull, there is a mill constructed for the purpose of bruising (not pounding) bones, which are sold at 1s. 11d. per bushel; and the dust riddled therefrom, being reckoned a stronger manure, at 2s. 3d. * The same person selects the best of the bones, which are sawn into pieces, for button-moulds and knife-handles; and the saw-dust from this operation is particularly useful in gardens and hotbeds. It suits every vegetable, hothouse, or greenhouse plant; and sells at 2s. 6d. a bushel.

Bone manure is most used in the west of Yorkshire, Holderness, and Lincolnshire; and is best adapted for cold, and light sandy land. The usual quantity per acre, is 70 bushels, when used alone; but when mixed with ashes, or common manure of any sort, 30 bushels per acre is thought quite enough. It is applied at the same periods as other manure; and has been found in this way to remain seven years in the ground. The rough part of this manure, after being five years in the ground, has been gathered off one field, and thrown upon another of a different soil; and has proved, even then, good manure.

Referring to the annexed statement, which evinces how valuable an article we are allowing the country to be deprived of; I beg to remain, Sir, your, &c.

	L.	*Per Ton.*	
Paid at Edinburgh to the poor people collecting, 2s. per cwt.	2	0	0
Cartage to Leith	0	3	0
Shore dues there	0	1	9
Freight to Hull	0	15	0
Probable landing charges	0	1	3
Cost at Hull per ton	L. 3	1	0

Besides agency at Edinburgh, waste, insurance, postages, &c. &c.

P. S. Bones, according to Fourcroy, consist, almost entirely, of calcareous phosphate.

* This must arise entirely from the matter of the bone being divided into more minute parts, thus admitting it to apply itself more intimately with the soil.

BRANCH II.

Review of Agricultural Publications.

An Account of the Systems of Husbandry adopted in the more improved Districts of Scotland, &c. &c. By the Right Honourable Sir John Sinclair, Baronet, President of the Board of Agriculture. Edinburgh, Constable & Co., &c. &c. 1812. Part I. pp. 432. Addenda, 20. Part II. 152. App. 66.

By an advertisement prefixed to this work, we are informed that it was drawn up at the request of a most respectable friend (Sir Joseph Banks), who 'urged, that it was incumbent upon 'a native of Scotland, while presiding at the Board of Agriculture, and possessing all the means of information which that 'situation afforded, to undertake the task.' The Right Honourable author has fully availed himself of these means; and we can readily believe, that the labour and difficulty attending the attempt, have gone far beyond every idea he could have previously formed of them. But Sir John had given sufficient proof that he was not a man to be deterred from any useful undertaking by such difficulties as zeal and indefatigable perseverance could surmount. He was not contented with carrying on a very extensive correspondence with proprietors and farmers in all the most improved districts of Scotland, but 'personally exa-'mined several of these districts, and conversed with the farm-'ers in their own fields.' He 'obtained, not hasty answers to 'questions suddenly put, but details maturely considered, and 'carefully drawn up.' The author modestly 'claims the merit 'only of collecting, condensing, and digesting the important in-'formation which was most liberally furnished.'—'The credit 'of *the knowledge*,' he adds, 'which this work may contain, 'belongs entirely to the intelligent and public-spirited farmers 'from whom that information has been derived.'

The far greater part of the work, as might be expected from this advertisement, consists of communications transmitted by a great many of the most eminent Scotish agriculturists; and also by some respectable correspondents in the southern part of the island. From the latter, a variety of hints concerning English husbandry are incorporated, with a view to make the treatise more extensively useful to the farmers of Scotland.

The utility of Sir John's labours must be highly appreciated by every friend to the best interests of his country. He has compressed, within a comparatively small compass, not ingeni-

ous theories on the principles of vegetation and the food of plants, but the details of operations and the results of extensive practice in almost every variety of situation, collected from a correspondence with more than one hundred of the most enlightened farmers of Great Britain, and authenticated by their names and places of residence. In contemplating these details, one is at a loss whether most to admire the correctness of operation, and adaptation of the various practices to different soils and local circumstances; or the liberality of Sir John's correspondents, in thus offering to the public, without the slightest view to their own interest, statements which, had they listened to the dictates of a narrow, selfish policy, it might, in some instances, have appeared their interest to conceal.

Among so many individuals, placed in very different situations, and certainly of unequal experience and talents, a considerable difference of practice and of opinion was naturally to be expected, especially on points of *minor* importance. Indeed, from the present imperfection of the art of agriculture, notwithstanding the great improvements that have been effected of late years, such a difference was inevitable.—We hope we may be permitted to avail ourselves of this plea, if we should venture to dissent, with the utmost deference to the justly respected author, from some of his opinions.

The Treatise is introduced by an enumeration 'of the various circumstances which have contributed to the excellence of 'Scotish husbandry,—and an explanation of the plan of the work.' Of the fourteen different causes assigned, the author justly observes, that it is to the custom of granting leases for a term of years, perhaps more than to any other cause, that the excellence of Scotish husbandry is to be attributed. This is indeed an essential and primary step to the improvement of the soil by farmers; but these leases must be formed upon equitable and even liberal principles,—the tenant must be liable to no arbitrary and undefined exactions, particularly such as become more or less severe and oppressive, exactly in proportion as his improvements are more extensive or confined. The Scotish farmer, as noticed by the author (p. 5) has now little reason for complaint in these respects; at least his condition is vastly more favourable than that of his brethren in England. If, to such leases, we add the advantage,—not merely of security of possession, but of a considerable degree of encouragement afforded by our laws respecting the division of commons, the erection of march-fences, the valuation of tithes, &c. by which the improvements of proprietors are greatly facilitated,—and the superior education, and habits of order, economy, and industry, of even the lowest classes, for which we are chiefly indebted to the 'esta-

'blishment of parochial schools' (pages 2 & 6); our southern neighbours ought not to be surprised, that, notwithstanding their greater capital and local advantages, they have been overtaken, and even outstripped, by their poorer—and from soil, climate, and markets, often less favoured—fellow-subjects, in the career of agricultural improvement.

Were it necessary to reconcile their minds to the admission of this,—though certainly, in this respect, there ought now to be no other distinction made between South and North Britain, than between any southern and northern county of the United Kingdom,—we might remind them of their immense superiority in manufactures and commerce, over every nation on the globe. But we make the allusion for another reason, and have long imagined, that their very superiority in these branches, with the decided preference which their municipal laws give to them over agriculture, is not among the least causes why this latter art has been long stationary in the southern parts of the island; and, perhaps, durst we venture to give an opinion, which we fear will be regarded as most absurd by even many intelligent men who have not deeply reflected upon the relative situation of Scotland, it might be maintained, with at least some plausibility, that the absence of numerous and extensive manufactures in this part of the kingdom, while an ample and steady market is insured for all our spare farm-produce by those of the South, is not one of the circumstances which have slightly contributed to the excellence of Scotish husbandry. Nor can it excite surprise, that this apparently problematical cause has not been noticed by our author, as it would have led to a discussion which might not have interested the greatest part of his readers, and one upon which we therefore decline to enter. Those, however, who have read Mr Arthur Young's Tour through France, will find that we are not singular in this opinion; and may be able to assign, upon reflection, some reasons in support of it.—The author indicates his plan as follows.

'In regard to the plan proposed to be adopted in the prosecution 'of this important inquiry, it is intended to divide the work into two 'parts.

'Part I. will be purely practical, detailing, *first*, the best practi- 'ces of the most distinguished Scotish farmers regarding those points 'which require attention, previous to the commencement of arable 'culture; and, *secondly*, those particulars will be discussed which are 'connected with the actual cultivation of an arable farm, and the 'most profitable means of maintaining its stock. It is proposed to 'conclude this part of the work with, 1. A general view of the im- 'proved systems of husbandry adopted in Scotland; 2. An account 'of the improvements of which those systems are susceptible; and, '3. Some observations on the means by which the useful practices of

'the best Scotish farmers may be most advantageously disseminated 'throughout the less improved districts of England and Scotland; 'together with a general view of the public and private advantages 'which may be derived from their more general adoption.

'There are some questions, however, connected with the husbandry of Scotland, and with the improvement of that country, 'which are rather of a more abstruse nature, the explanation of which 'requires a good deal of research, and much reflection, thoroughly to 'comprehend; in particular, the size of farms, and the establishment 'of a liberal system of connexion between the landlord and tenant. 'These are points, therefore, (together with the characters of those 'who are employed in agricultural labour in the more improved districts of Scotland), which it is thought more advisable to place in a 'distinct division of the work (Part II.), and to discuss in separate 'dissertations.

'In an Appendix, will be stated some particulars connected with 'the improvement of waste lands in Scotland (a subject to which the 'public attention cannot be too frequently called), and several other 'points, respecting which, the author trusted, that the information he 'had to communicate would be acceptable to the public.' p. 8.

It shall be our endeavour to give our readers as satisfactory an account of the manner in which these different subjects are treated, as the limits of our work will admit, according to the arrangement which it has been thought proper to adopt; merely, however, that we may induce them, by perusing the Treatise itself, which may, not unaptly, be styled the Scotish Farmer's *Vade Mecum*, to cultivate a more intimate acquaintance with its various and important details.

The first chapter of Part I. is divided into nine sections.

'1. The position of the farm-house and offices; 2. Their con-'struction; 3. The size of the fields; 4. The mode of fencing; 5. The 'draining necessary; 6. The roads on the farm; 7. The instruments 'of husbandry; 8. The live stock; and, 9. The soil, the elevation 'and exposure, the climate, and the situation of the farm in regard 'to markets. It is proposed to discuss each of these points as briefly 'as their importance will admit of, in separate sections.' p. 9.

In section 1st, the advantages of the central situation of the farmer's house and offices are very justly estimated, on extensive farms, as often equal to the saving of a plough, or at the least 100*l.*; a calculation which confirms what was stated, without pretending to minute accuracy, in our last Number, in the Review of the Aberdeenshire Survey, when noticing what is called by the author of that work the 'Distribution' of Farm Offices; and the additional houses found necessary upon a farm of a very moderate size in that county. Upon very large farms, double that sum, it is stated by a farmer of great talents and extensive experience, may be saved by proper attention to this circumstance. At the same time, we believe that, in Scotland, this point is generally attended to, as far as circumstances

will permit, when new buildings are erected. Though the author admits that there are authorized exceptions to the rule, as was hinted at in the article referred to, there cannot be a doubt of the justness and importance of the general axiom, '*That the farm-house and offices ought to be placed, as nearly* 'as possible, *in the centre of an* "arable" *farm.*' Scotish farmers, at present, are not usually deficient in attention to this circumstance; and though our forefathers ought not to be rashly censured for having adopted the more secure plan of placing their dwellings contiguous, at a time when it was sometimes necessary to the protection of their persons and property, it is not easy to conceive any sufficient reason why this practice should be retained (as we are informed by the author it is) in some districts of England at the present day.

The 2d section, 'On the construction of a Farm-house and Offices,' is properly introduced by some account of the advantages, both to the farmer and the landlord, of suitable accommodations. The plan and dimensions of the farmer's house, it is evident, must be varied according to the extent and value of the farm; but we confess ourselves partial to what is commonly called a *double* house of two stories, in preference to one of three. To such a house, either wings, or, what is certainly preferable, 'a back jamb, or lean-to,' as well as attic apartments, may be added, if requisite; and to prevent any danger of dampness, and to give still more accommodation, part, or the whole of the area, may be excavated, and employed by cellars, washing-house, &c. This opinion is not formed altogether upon calculations of expense indeed, but chiefly upon views of convenience, and as best adapted to the greater part of farmers, as it affords to the mistress of the house more facility in the superintendance of her household.

This section contains several very valuable observations on the construction of farm-offices, though the author certainly does not exhaust this important subject, nor enter into a particular description of the number and arrangement of the offices, according as the farm is of a light dry turnip soil, or one of an opposite character.

On turnip farms, instead of 'holes left in the wall, with 'shutters, to allow of putting in the food, for the convenience 'of feeding cattle at the head,' the plan of feeding-houses, now adopted, deserves to be recommended. The cattle, in this case, are not tied up close to the wall, but to posts from three to four feet distant from it. The feeder has therefore room enough to wheel his barrow, loaded with turnips, along the whole length of the feeding byre, depositing to each beast his allowance as he proceeds. The man himself, and the food of the cattle, are thus secured from the severity of the weather, if there is, a

there always ought to be, at one end of the feeding-house an apartment for the turnips, the outer door of which should give admission to a loaded cart; and at the other, a place for holding hay and straw.—We beg leave to suggest one other improvement, not so generally adopted;—that the granary, instead of being placed above the cart-sheds, often at a distance from the barn, may be advantageously situated under the roof of the barn itself, by the addition of another floor, and of a few feet to the height of the walls; both of which are indispensable, wherever the granary may be placed. In this situation, the grain, as it is dressed, may be taken up to the granary by *hoisting-tackle*, driven either by the thrashing mill or the hand, from the ground floor; and if the barn door is so large as to admit of carts *backing* into the barn for a few feet upon a pavement, the sacks may be filled above, and lowered into the carts from the granary, with very little labour, and greater expedition, than from any other part of the offices where the granary is usually placed. Several other advantages might be pointed out as connected with this situation of the granary.—The propriety of placing the hay-stack so near the back wall of the stable as to permit the hay to be thrown from it through an opening above the stable loft, might be adverted to, as well as several other circumstances apparently trivial, though justly appreciated by an attentive farmer, if our limits allowed us to do more than just to hint at the saving of expense, and the convenience of proper arrangements.—The subject of this article deserves the most careful consideration of proprietors who are about to erect new farm-offices. We have had occasion to know that much money has been most unprofitably expended by some of them; and have seen a farm-house and offices, that had been built but a very few years before on a most substantial and expensive, though not convenient, plan, pulled down to the foundation on the entry of an active and intelligent tenant.

The author, after giving some account of the hammels used for feeding cattle by Mr Robertson of Ladykirk, points out the advantages of similar sheds for working horses, adopted several years since, by Mr Heriot, the tenant of Ladykirk farm, which well deserve the attention of our readers. In these 'open horse-'hammels, each shed holds two horses, with a niche for their 'harness. To each there is an open small straw yard. Each 'has a water trough, and each a gate large enough to admit 'a cart to take out the muck.' This spirited farmer has 'lost 'none of his horses by death for a number of years, and they sel-'dom have colds or any other disease. His horses lye in these 'open hammels in winter; and it is remarked, that in frosty wea-'ther, when snow is falling, and lying on the ground, the animals 'do not go under cover, but prefer to lye out, with their backs and

'sides covered with snow. It is well known, that if a horse is kept 'out in winter he will have no grease, nor swelled legs, and per-'haps no other disease. These hammels seem to have all these 'advantages, at the same time that they protect the animal from 'damp, and prevent his back from being kept wet by heavy or 'long continued rains. Every farmer who keeps a large stock of 'horses, occasionally loses one by inflammation brought on by 'coughs and colds: But the horses of the farmer alluded to become 'aged; and he has not had occasion to purchase a young horse 'for several years. It is evident, that horses taken out of a warm 'stable, perhaps with some degree of perspiration on them, when 'they stand behind a hedge in a cold day, either to have their corn 'given them, or when the servants are taking their dinner, must 'be much more liable to catch cold, than if they had been harden-'ed by being kept in open sheds, in the manner above described.' p. 23.

The plan of a stack-yard, described by the author, we can assert from experience, deserves all the praise bestowed on it, though its obvious advantages are too often disregarded in practice.

This important section is concluded by the discussion of two questions: 1st, By whom ought the farm-house and offices to be erected? and, 2d, By whom ought they to be kept in repair? Upon the former, we shall only remark, that in the very few cases where a tenant may prudently undertake the burden of erection, it would be adviseable that the deduction from the rent, allowed on that account, *should be distinctly specified;* and that, in other cases, he ought not rashly to engage for the carriage of materials, at a time when he has almost always occasion for more horses than at any subsequent period of his lease.

The two next sections treat of the 'Size and Shape of Fields,' and 'Of Fences.' Under the first of them, several circumstances which deserve consideration are fully stated, and the loss and inconvenience of small fields, so common in England, illustrated in a very satisfactory manner. The section on fences is short, and rather meagre.

Section 5th, 'Of Draining.' We shall extract the first and last paragraphs; and can assure our readers they will obtain useful information from a careful perusal of the intervening observations,—and of an excellent paper (in the Appendix, No. 4), respecting a proposed law on this subject.

'There is hardly any point to which an industrious and skilful 'farmer would be more inclined to direct his attention, when he 'commences the occupation of a farm, than to the state of its 'drainage; for on that the success of his future operations must 'essentially depend. "Lay your land dry, whatever may be the "method pursued, or the expense to be incurred, before you at-

" tempt any thing else," was the maxim of the celebrated Arbuth-
' nott, and is the basis of good husbandry.

' Mr Robertson of Ladykirk is of opinion, that, with the excep-
' tion of a few districts of dry loam, the greater part of the coun-
' ties, both in England and Scotland, stand more in need of drain-
' ing than of manuring; and that there are very few districts in
' either kingdom where a perfect knowledge of this essential source
' of improvement is at all general. The difference it would make,
' were draining in Scotland carried to the extent it might be, is be-
' yond all calculation.' p. 47, 48.

The next section treats of the advantages to be derived from good Roads, and notices the great improvements which have taken place, in that important branch of political and rural economy, in many parts of the country; which the following extract clearly exhibits.

' In that fertile tract of country, the Carse of Gowrie, prior to
' the year 1790, there was no road that could admit of carting
' through the winter or spring months; every thing was to be car-
' ried to market on horseback; and the horses often sunk to their
' bellies. But now, the turnpike-roads in that district are as good
' as in any part of the kingdom; and by the judicious application
' of the statute-service money, the greater part of the farmers have
' been enabled to make good private roads to their own doors, by
' means of which 32 cwt. of coal may be carried upon a two-horse
' cart from the harbours; and 150 or 200 stones of hay, tron weight,
' are carried by each two-horse cart to the towns of Perth and Dun-
' dee. By these means, the rent of land has been prodigiously
' advanced.'

The author's observations, however, are not confined to ' farm roads;' many of them are applicable to roads and road-making in general. The advantages of broad cylindrical wheels, the general adoption of which is considered to be a necessary prelude to the improvement of the roads, are pointed out by several respectable correspondents; and those wheels are highly approved of by the author. The great benefit of one or two pairs of broad wheels has been long experienced by many farmers, who have occasion to employ carts when their fields are wet; particularly, in carrying home turnips in winter.

The 7th Section treats of the ' Instruments of Husbandry.' After a concise account of the Ploughs, Harrows, and Carts in common use, the author proceeds to those of a different description,—the Fanners and the Thrashing-mill. His observations on the latter most valuable invention deservedly occupy the greatest part of the section; and are properly introduced by a well merited encomium on the late Mr Meikle, who so greatly improved it, or rather first rendered it an useful and effective implement. ' It is not intended in this place,' he observes, ' to give any

'description of the nature of the machinery,' but to lay before the reader, 1. An account of the different powers used in driving the machine; 2. A short view of its advantages; and, 3. Some hints for its improvement. Under the first division we beg to direct the particular attention of our readers, to the recommendation, by one of the author's correspondents, of employing oxen rather than horses. We know that they are employed by many farmers, who are much pleased with their labour. Indeed, were we inclined to differ from the author's opinion, of the advantages of the different powers applied, it might be suggested, that the saving by horses is not quite so great as is stated. We have seen some very accurate calculations of the comparative expense of the flail and horse-mills, by which the price of thrashing per boll by the latter did not appear much less than by the former. This, no doubt, must depend in a great measure upon the kinds of crop, and the quantity to be thrashed. While, however, the other recommendations of a thrashing-mill, driven even by horses, upon a farm not of a very small size, are fully admitted, the general employment of oxen in their place would, in a great measure, remove the objection as to expense.—The author next enumerates the advantages of the thrashing-mill in a very concise, accurate, and striking manner; and concludes this part of the section with an account of some recent improvements upon it, most of which have been noticed in this and former Numbers of this Magazine. We warmly recommend a perusal of this part of the treatise to those farmers who still continue the use of the flail: and most sincerely hope, that in the southern parts of the island it may have the effect of inducing a trial of the machine, which, *if properly constructed, and skilfully managed when at work*, must very soon proclaim its own merits, and triumph over every prejudice.

This section is concluded, by just noticing some other implements, such as Drills, Rollers, &c. And, 'on the whole,' subjoins the author, 'it may be safely asserted, that there is no country 'in Europe, where farming is at all understood, where the imple'ments of husbandry are so few, so simple, so cheap,* or so effec'tive, as those in Scotland—a circumstance of infinite moment to 'the industrious husbandman.' p. 96.

In the 8th Section, 'Of Live Stock,' the author observes, upon the authority of a respectable English correspondent, that 'in regard both to the beauty of form, and quickness of feed'ing,' the Scots cattle 'are equal to any.' He then proceeds to notice the various breeds; of which a particular account is

* The thrashing-mill, though it costs a considerable sum, yet is the cheapest of any, considering the work it performs.

promised in the General Report for Scotland. We request the attention of our readers to the following valuable observations on the advantages of providing cattle with a plentiful supply of water when kept on dry fodder.

'Mr Dudgeon having a number of Highland cattle consuming 'straw and chaff on a farm unfit for turnips, an old man was appointed to discover, how often they went to a watering trough, within 'the close, in a short cold winter day. That he might not be confused in the execution of his orders, one particular bullock was 'pointed out, on which he was to make his report. According to 'that report, which there is every reason to believe may be relied on, 'he drank *eight times* in the course of the day; and the man was convinced, that all the rest of the cattle drank as often as the one fixed 'on. How then is it possible that they can be properly supplied when 'they are sent out to drink? Twice a-day is as often as cattle are 'driven out to water; and some of them do not get one drink. The 'strongest, or most forward, first supply themselves, always abuse 'the water, and (especially in a pond) render it unfit for the rest, 'and even for themselves during the rest of the day. Their shivering attendant, glad to get them done with their drinking, hurries 'them back to the close. Indeed cattle are not able, at one or two 'opportunities, to drink a sufficient quantity of water, in cold weather, to moisten and digest coarse food. Mr Dudgeon, aware of 'this circumstance, brought in water by a lead pipe to a cistern, 'about seventy yards distant from a dam-head. The cistern consists of common rough building. A stone, or trough, is placed 'within the farm yard, communicating with the cistern by a pipe of 'two inch bore; and the trough, being upon a level with the cistern, it stands always full, being regularly supplied as it is made 'use of. This is a most valuable acquisition. Mr Dudgeon is convinced, that a moderate-sized ox will, by an abundant supply of 'water, improve much more rapidly during the course of a winter, 'if he is supplied with water when he requires it, than when he is 'occasionally driven to it.' p. 100, 101.

It is not in our power, from the limits to which we are at present necessarily confined, to examine the comparative profits of feeding sheep and cattle; but, before any certain conclusions on the subject can be established, many circumstances, besides those stated by the author, deserve attention; though we think that, upon soils suited to a sheep stock, (and there are some, as it is well known, upon which they cannot be preserved from the rot and other distempers), the sheep will pay better for his grass than the ox. We, however, fully agree with the author, 'that 'a mixed stock of cattle and sheep' upon pastures suited to both, will pay better than when the grass is consumed by either kind of stock only. But in this case it ought to be observed, that an equal share of pasture should not be allowed to each kind. For every ox, for instance, to put on such a number of sheep as may be

supposed to consume an equal quantity of grass, would not be adviseable; but, according as the pastures are best adapted to cattle or to sheep, let the one or the other have by far the most considerable proportion of them.

Upon the Dairy Cows, particularly those of Ayrshire, with their management and produce, the author has collected a great deal of useful information. But as the respectable writer of the Survey of Ayrshire has in that work gone very fully into this too much neglected branch of rural economy, and has obligingly promised to favour us with a continuance of his correspondence on the subject, the first part of which was presented in our last Number, it is the less necessary to make extracts from this part of the work of the worthy Baronet, which we earnestly recommend to the consideration of the many farmers who have a very imperfect acquaintance with the profits of a well managed dairy.

The author's observations 'on Working Oxen,' certainly deserve the attention of those farmers who have much old coarse tough sward to bring into cultivation; for we believe the steadiness of their draught is their principal recommendation. We should strongly suspect, when informed that a plough with two oxen does as much work as one with horses, (and that both are going in the same field), that their drivers are upon a very friendly footing, or their cattle very unequally wrought.

After a few remarks on Sheep, we come to the third class of live stock—Horses; which are treated of at considerable length under the articles of Food; Expense of Keeping; Advantages of working them Lengthways; Quantity of Work; the Mode of Supply; and Miscellaneous.

An English correspondent gives it as his opinion, 'that the 'breed of horses in Scotland is infinitely preferable, for the la- 'bours of husbandry, to any he has ever seen in England, com- 'bining action and strength in a greater degree than any of the 'English breeds; and he is convinced that, on an average, they 'may be kept at much less expense.' The Suffolk punches, the Lincoln blacks, and the Cleveland bays, have all been highly and justly celebrated for particular purposes and situations; but, for the general labours of husbandry, we certainly consider the Clydesdale breed as without a superior. With a view of diminishing the expense of feeding horses (and it might have been added, for the better preservation of their health), potatoes (particularly when steamed), carrots, yellow and Swedish turnips, with boiled barley, and whins, are all severally recommended as food for that species of stock. From the many respectable characters who recommend those different articles as a partial substitute for oats, as well as from our own experience,

we are convinced, that, to a moderate extent, they may be used with great advantage, with the exception of whins,—which we think never can, at least never will, be generally used as an article for the more economical feeding of horses.

The expense of maintaining a horse will be less or more, according to the quantity of work he executes; and it is therefore stated to be, in one county, so low as 15*l.*; and, by a correspondent in another, as high as 39*l.*; while several intermediate estimates are presented. The calculations, however, of two gentlemen, one of them well known as a clay-land farmer of great judgment and experience, and the other as a most intelligent and extensive farmer of turnip soils, deserve the greatest attention. The results of both, though the items are different, give a trifle more and less than 35*l.*, which, we believe, may be assumed as very nearly the expense of a horse regularly wrought through every season of the year, when prices are moderate. The total expense of a plough, by the calculations of the first gentleman, formed upon *data* which appear to be incontrovertibly accurate, in the situation alluded to, is stated at 135*l.* 1s. 8d.; which will be about 9s. a-day, excluding Sundays and holidays; or considerably more than 1s. per hour through summer and winter. How little is such an expense considered by servants, and even too often by farmers themselves! What losses are sustained by errands to the smith's shop, frequent and unnecessary delays at the end of the ridges, and other idle and pernicious practices!

In many parts of England, particularly in the middle and western counties, the practice is general, of ploughing with four horses, all yoked one before the other. We quote the following paragraph, chiefly for the consideration of the farmers in those districts. 'Horses, when working a plough in Scotland, 'are almost uniformly yoked abreast. It is well known, that animal 'power is most advantageously exerted when employed separately, 'and near to the work; and that it is hardly possible, when horses 'are yoked one before the other, or harnessed at length, that they 'will pull equally. The line of draught of the fore horses, indeed, 'being horizontal, and not at right angles to their shoulders, their 'full strength cannot be exerted; and a considerable portion of the 'power employed tends to act against, and to distress the horse next 'the plough or carriage; or a part of the power of the first horse is 'exerted to press down the back of the one behind him, and a part 'of the strength of the latter to resist that pressure.'

The quantity of work performed by a pair of horses, or rather the number of acres which they may cultivate, must, it is evident, depend in a great measure upon the soil, which of course regulates the management. On this point also there is

therefore a great diversity of opinion. On some farms, 40 English acres, and on others 62, are allotted to each plough.

The following remarks merit particular attention. It will be found in every case a beneficial practice, to break or bruise part of the oats or beans given to horses.

'The grinding of corn or beans for horses, more especially when 'they get aged, and begin to lose their teeth, deserves to be recom-'mended as a most excellent practice. The horses thus receive the 'whole nourishment; whereas, when given whole, many devour their 'corn entire, and it is seen to pass through them as they swallow it. 'Cutting straw into chaff may also be adopted with advantage.' p. 133.

This section is concluded by a few observations on Hogs; a species of stock which was, till very lately, too much neglected by Scotish farmers; and in many counties it is so still. Its principal recommendation, however, is not, that certain profits can be regularly obtained from it, because it can be bred in such numbers, and in so short a time, as to reduce its value greatly below that of other animal food. But a few pigs, kept in a farmer's straw-yard, have often brought from 50*l.* to 100*l.* a-year, almost without any trouble or expense that could be regarded as of any consequence. And as in this, as well as every other species of animals, there is a great variety of breeds, it is surely of some importance to select the most profitable. It is ascertained by experience, that one pig will devour as much food, and still continue lean, as would fatten completely two of a different litter, even of the same dam, after being crossed by a better boar.

The last section of the first chapter briefly notices the importance of paying attention to the Soil, the Climate, the Elevation and Exposure, and the Situation of a farm in regard to markets, before a farmer commences his arable operations on any particular farm; and certainly these circumstances require the most deliberate reflection of every individual who expects to succeed as an agriculturist; and cannot be neglected with impunity.

In the conclusion of the chapter, the right honourable Author pronounces a pleasing and just eulogium on the character of a *real farmer*. And coming from such authority, and founded upon a most extensive acquaintance with the respectable and intelligent of that class of society, such sentiments, in the estimation of every impartial man, as well as of farmers themselves, must amply solace the latter when exposed to the ridicule to which the author alludes; or even to the petty malignity, and contemptible insolence to which some of them may occasionally be subjected, and which, *for a time*, they may be compelled to endure in silence.

Chapter 2d of Part 1st is divided into 13 Sections—Of Ridging fields—Manuring—Ploughing—Fallowing—the Crops to be cultivated—the Rotations to be adopted—Sowing and Covering the seed—Weeding—the Harvesting of the grain—the Preparing it for market—Soiling, or Feeding stock with cut green food—Whether it is proper to have any part of a farm in Permanent Pasture—and, the best Mode of making Hay.

In Section 1st, 'on Ridging,' it is remarked, that, upon wet soils, where the ground is flat, from 240 to 300 yards is considered to be the proper length; and upon dry soils, where the land is level, from 350 to 400 yards is the length recommended.

A great diversity of opinion prevails among the author's correspondents respecting the proper breadth of ridges, one preferring a breadth of four feet, while others contend for almost every intermediate one to 30 feet. The proper breadth of a ridge must depend, 1st, upon the nature of the soil; and, 2d, the convenience of ploughing, manuring, sowing, harrowing, and reaping. 'It is of little importance,' (as is justly remarked, p. 149), 'whether ridges are formed at all, on very dry 'porous turnip soils, unless to regulate the sowing and cutting 'down in harvest.' On such soils, ridges are often to be found 36 feet broad, or, as they are provincially termed, *Band-win' rigs*; that is, 6 shearers and one bandster are employed upon each. It may be just noticed, that upon such soils, particularly when laid down to grass, it is wished, by skilful farmers, that the ridges and furrows should be as level as possible. The fields are frequently depastured by Leicester sheep; and when they lye down in a deep furrow upon their backs, they are quite incapable of rising, and must soon perish if the shepherd does not come to their relief. Indeed, this will often happen where the surface is quite level. Upon clay and wet soils, a very different breadth will be required; and it seems impossible to specify one that ought to be generally adopted. We may, however, venture to suggest, that any multiple of 6 feet, as 12, 18, or 24, will be found more convenient for sowing, harrowing, &c. than that of any other number; and on this account, though we should in general prefer a breadth of 18 feet, yet, upon *deep* rich loam, admitting of being thrice gathered, ridges of 24 feet may be formed with much propriety; while, upon a thin wet clay, which will scarcely admit of being gathered at all, a 12 feet ridge might be most advantageous.

Section 2d, 'on Manures,' treats of the most approved methods of applying dung, urine, lime, marl, seaware, and composts. It seems to be a point 'not yet decisively ascertained, 'which is the best mode of using stable dung, whether in a fresh 'or rotten state.' Our experience leads us to think, that dung

made while the horses are feeding upon cut clover, or tares, may be applied with the greatest advantage, in a fresh state, to fallow, or to clover or bean stubble, when it should be ploughed down immediately upon being laid on, and the fields sown with wheat in the autumn. In almost every other case, we would prefer having the dung completely rotten, or at least in a very advanced state of putrefaction, so as, according to the remark of a correspondent of the author, it might be cut with a spade. Upon this important, and indeed essential, requisite to the success of the farmer, we beg to refer to the work itself, in which will be found some very judicious observations, which we have not room to extract. It will not be necessary to caution practical farmers against the theories of certain speculative gentlemen, in favour of fresh farm-yard dung; by one of whom we have heard it asserted, that it is to the use of rotten dung that we are solely to attribute the ravages of the fly upon turnips, and the baleful diseases of smut, mildew, &c. in wheat crops!

When treating of 'Lime,' it is observed, that 'there is perhaps no country in Europe where calcined lime is used to so great an extent, and in such quantities, as in the more improved and improving parts of Scotland,' being often carried from 20 to 30 miles inland, to places 1000 feet above the level of the sea, after being imported from some distant maritime county. The quantity applied per acre is very different, varying, according to the nature of the soil, and other circumstances, from 16 to 100 bolls per Scots acre. To give some idea of the extent to which lime is applied, it is observed of one farmer, that, since June 1808, he had gone over about *eight hundred and fifty acres*, at the rate of 40 to 50 bolls of shells per acre, though it was brought from a distance of 24 miles. * At the same time, this important branch of rural economy has been so amply discussed in this work, that it is unnecessary to state here the modes of applying lime, and its effects, further than by just noticing how fully the experience of Mr Dawson (see No. 49. page 69), whose name is well known to stand in the first rank of British agriculturists, corresponds with the following observation. 'Nothing,' says one of the author's correspondents, '*assimilates the produce of outfield to that of infield land*, so much, as a good dose of lime laid on at once.'

Sea-ware is considered of such importance as manure, that land upon the coast, where it is to be had in considerable quantities, is reckoned worth more rent, to the amount of from 10s. to 15s. per acre. 'On some farms near Dunbar, the land is covered with sea-ware every second year, which enables it to

* The author has committed a mistake in the measure of the boll, which, in that district, contains, not 6, but 4 Winchester bushels.

'go through that severe rotation; 1. turnip; 2. spring-sown 'winter wheat; 3. clover; and 4. wheat again.' The rent of such land, as might naturally be expected, is very great; from five to nearly seven pounds per acre being common rents for extensive farms, although not near any large city, by which uncommon advantages might be obtained in the disposal of the farm produce.—The advantages of compound dunghills are pointed out in a clear and satisfactory manner; and certainly, in almost every situation where the aid of foreign manure cannot be procured, considerable benefit may be derived from the application of composts, with the forming of which almost every practical farmer is less or more acquainted. Indeed, a well prepared compost will often prove more beneficial than any of its parts applied separately. Its effects are not merely to produce a temporary fertility, but a valuable permanent addition to the deepness of the soil.

The section 'Of Ploughing' contains many judicious remarks on the proper performance of that important operation. The advantages of raising the furrow-slice with a sufficient shoulder are so apparent, and so necessary, that the seed may be completely covered in harrowing, that we are astonished to think any individual should recommend laying the sod perfectly flat. Such, however, is the general practice in Norfolk, and some of the adjoining counties. We have had the opportunity of conversing with practical farmers there on this subject; and although they could give no reason whatever for the practice, yet they readily admitted the difficulty they found in covering the seed with the harrows. We had also the opportunity of seeing an implement, in all respects like a heavy roller, only that it was bound round with iron rings, about nine inches from one another, and about six inches deep, which, when driven along the smooth surface, left a certain number of ruts, which facilitated the process of covering the seed; and this the English farmers considered a great improvement. Were it but for this section alone, it is to be hoped that this volume will find its way into more counties.

There is no particular practice in agriculture, perhaps, which has given rise to more keen dispute, than that of the necessity of, or utility of, summer-fallowing; the antifallowists, with the Secretary of the Board of Agriculture at their head, contending, that a judicious intermixture of green crops, drilled, and properly horse and hand-hoed, is sufficient to continue the soil, of all descriptions, in a clean and productive state; while the advocates for fallowing have insisted upon the absolute necessity of frequently repeating that operation, upon all clay soils, and indeed any other kind of soil, if incumbent upon a close and

retentive subsoil. As experience and observation have proved to us, in the clearest manner, the accuracy and justness of the latter opinion, it was with pleasure we observed that section 4th, which treats of that necessary operation, begins with the following observation. 'Summer-fallowing of land, or the practice of working it during the summer months, has undoubtedly been the 'chief source of improvement in the clay soils of Scotland; for 'the ground in cultivation, having been kept in constant tillage 'for ages, was infested with weeds of various descriptions, which 'by no other means could be kept down or eradicated. In dry 'soils, since the introduction of the turnip husbandry, fallowing 'has no longer become necessary; but in strong lands, it is still 'accounted the foundation of their fertility, by the most intelligent practical farmers that Scotland boasts of. Indeed, the 'peculiar correctness and attention with which the fallowing 'process, in strong soils, is executed in Scotland, is considered 'to be one of the most important and distinguishing features of 'the Scotch system. It is not repeated so frequently as it is in 'many districts of England, occurring in general but once in the 'course of six years; the soil of the field subjected to this operation, however, by frequent ploughings, though consisting of the 'strongest and most stubborn clay, is thus completely pulverized; 'weeds are extirpated; insects are destroyed; and fertility insured during the whole course.' This section contains many useful hints regarding the most proper mode of conducting the process of summer-fallowing; and therefore we earnestly recommend it to the perusal of those who have not yet discovered the advantages of the system, as it is universally allowed in Scotland to be '*the groundwork of good husbandry.*'

Beans, Peas, Tares, Potatoes, Swedish turnips, Cabbages, and Rape or Cole seed, have been frequently recommended as substitutes for plain fallow upon clay soils; but the three first require to be sown so early, that it is utterly impossible, where the land requires cleaning, to prepare it in a proper manner; and in carrying off the other articles, the ground is more injured by poaching with carts and horses, in almost every instance where such crops are attempted to be raised, than all that the value of the produce will amount to; besides the utter impossibility of leaving the land so completely clean after any of those crops, as after a summer fallow. With regard to the last kind of crop, rape, which admits of being sown later, and eaten upon the ground earlier, than Swedish turnip, some observations worthy of attention are communicated by an experienced and very ingenious farmer on the English borders. 'This crop, he remarks, may be eat off in August or the beginning of September, and then wheat may be sown.' 'He never saw' (it

added) 'more beneficial crops of red wheat, than he has thus 'obtained upon poor clays.' The author, however, justly observes, that 'it is hardly possible the ground could be placed in 'that husbandman-like condition, by the culture given to the 'rape crop, as by a naked fallow:' and to this he might have subjoined, that upon a clay-land farm, under a regular rotation, where a sheep stock cannot be advantageously kept through the whole winter from the want of turnip, to purchase sheep for the consumption of a few weeks' food, and be compelled to send them to market when it was finished in the month of September, would be a very dangerous and imprudent experiment; though, upon the poor soils alluded to, and in the situation of this intelligent farmer, who keeps a large flock at all times, there can be no doubt of his having occasionally experienced the benefits of this practice. This does not, however, affect the general question as to the necessity and advantages of fallowing clay soils.

That most intelligent agriculturist, Mr Curwen, observes, that fallows in England are generally done in so slovenly a manner as not to deserve the name. Before deciding on their utility, he with great propriety urges their being managed with the same care and attention that is practised in East Lothian. We believe that, not many years ago, this gentleman was hostile to the practice of summer-fallowing; but latterly, a more intimate knowledge of the subject has led him to form a very different conclusion. When it is considered, that in the district of the Island, where the warmest advocates for the system are to be found, there the rent of land is higher than perhaps in any other part of the kingdom, of the same extent, it may be presumed, that many others, if they should take the same trouble to make themselves acquainted with all the *minutiæ* of the process, and its consequent advantages, would be brought to the same opinion that is now held in its favour by the worthy President of the Workington Agricultural Society.

Section 5th. The crops usually cultivated in Scotland, are, 1st, Wheat; 2d, Barley, including Bear or Big; 3d, Oats; 4th, Peas; 5th, Beans; 6th, Tares; 7th, Turnips; 8th, Potatoes; and 9th, A mixture of Clover and Ryegrass: Carrots, Cabbages, Kale, Rye and Flax, are also occasionally cultivated; but none of these articles find a place in the general husbandry of Scotland. It is remarked, that 'the growth of wheat has greatly 'increased in Scotland, being cultivated in many districts where 'it was formerly unknown; and in situations, where, from their 'elevation, it was formerly thought impossible to raise it, having 'already been grown from 500 to 600 feet above the level of the 'sea.' When speaking of the different kinds of wheat generally cultivated, notice is taken of that species commonly called

creeping wheat, that is said to possess a quality which no other wheat has, viz. not being liable to be thrown out of the ground during the winter by frost. If we may be allowed to give an advice, we would caution our readers not to trust too much to such an assertion, as from our own experience in the cultivating of that kind of wheat, as well as from what we have observed in the fields of our neighbours, we are perfectly convinced that it possesses no such quality; in fact that it is only one of the varieties of the common red wheat, without any particular qualification to recommend it.

It is observed that barley 'was formerly the great favourite of 'the Scotch farmers, but is not so much run upon as formerly, 'since crops of wheat, by the introduction of fallows, have be- 'come more certain and productive.' In many parts of Scotland, more especially in the northern districts, the culture of that species called *bear*, or *big*, is recommended, (and we believe frequently adopted), instead of two-rowed barley; as on ordinary land yielding a tolerable crop of bear, there will be a considerable deficiency of barley; and the author considers it unfortunate, that the culture of so useful a crop should be checked by improvident enactments, imposing a higher duty on bear, in proportion to its value, than on barley. But some may be rather inclined to think it a matter of indifference; as, wherever barley cannot be grown to advantage, there is reason to believe that oats, in every point of view, is the most valuable crop that can be cultivated. We are aware that, in making this remark, we are exposing ourselves to the censure of the advocates for the non-equalization malt-duty bill; yet nevertheless, from every thing we have seen or heard relative to the culture of these two kinds of grain, we have no hesitation in recommending a crop of oats in preference to bear, in almost every situation with which we are acquainted, except to the extent that may be necessary for bread-corn, which is comparatively small.—Peas are not a favourite crop with the generality of Scotch farmers; but beans are cultivated with success in rows, on most of the clay soils of the kingdom, although a heavy loss is often sustained in cultivating that crop, from the lateness and wetness of the climate.—Tares are only sown in small quantities to be cut green for horses, between the first and second crops of clover; and for this purpose, they are of great value to the farmer. If they were sown 'at two or three times to give a succession,' as recommended by an intelligent correspondent of the author (p. 255), they would probably be found an advantageous substitute for the second crop of clover altogether, which in that case might be consumed upon the land. Indeed, when the soil is light and weak, to depasture the second crop of clover with

sheep or cattle, particularly the former, is a practice much to be preferred.

'Drilled turnips' (says the author, p. 256) 'is one of the 'great boasts of Scotish agriculture; and though the idea of 'drilling them was originally taken from the celebrated Tull, 'yet the precise mode of conducting this operation, now univer-'sal in this country, certainly originated in North Britain; and 'Mr Dawson of Frogden is the individual who first brought 'that practice to its present state of excellence.' The introduction of the turnip husbandry into this country, has been of very great advantage to the public at large; and the man who first taught our farmers the most economical and perfect method of cultivating that valuable root, has certainly high claims on its gratitude, as well as on that of the agricultural part of the community in particular. Indeed, the culture of turnips as a rotation crop upon light soils, has given to these soils a value which it would have been vain to have expected from any other leguminous crop yet known in this country: nothing has so much contributed to the improvement of agriculture, as this valuable root. Though its immediately beneficial effects are sufficiently obvious, there are others perhaps of still higher importance, which are not so fully appretiated. It would be easy to trace its consequences through both the arable and grazing departments of husbandry,—to prove that, for both the quantity and quality of our grain and butcher meat, we are greatly indebted to turnips. Perhaps we should be warranted in proceeding farther, and in attributing, in a considerable degree, to the general cultivation of drilled turnips, the enlargement of the size of farms, and the general opulence and intelligence of the tenantry who occupy any considerable extent of light dry soils. It is at least certain, that, without this crop, all the different branches of husbandry cannot be combined, as they often now are, under the direction of one farmer;—the breeding, rearing, and fattening of sheep and cattle, with the most correct cultivation of every species of white crop; and the most beneficial mode of converting the straw of these crops into valuable manure; with the application of it to the soil with the greatest effect, and under the most favourable circumstances. There are different sorts of turnips cultivated in Scotland; but the Globes, and the Swedish are the most prevailing varieties. Forty tons per acre of the former are reckoned a good crop; and from twenty-five to thirty tons of the latter sort, fully an average one. But the yellow turnip has been deservedly recommended as a kind that ought to intervene; and it is alleged by several respectable farmers that it may be employed as a substitute for Swedish turnips, to which, on several accounts, they give it

a preference. When turnips are extensively cultivated, it would certainly be advisable, and indeed it has become not an uncommon practice, to sow a less or greater proportion of all the three species,—according to the views of the farmer,—the kind and condition of the stock by which they are to be consumed,—and the periods at which he proposes to send his beef or mutton to market. By this practice he may insure a regular succession of this valuable root from October to June, even though the winter should prove more than usually severe. For the benefit of our English readers we would gladly enlarge upon this subject, but at present must be contented to refer them to the work itself, from which they will derive much useful information.

The mode of raising potatoes by the plough in drills, is general through the country; but the extensive cultivation of this article for sale, is confined to the immediate neighbourhood of towns, and populous villages. The average weight per acre, is stated at from 40 to 50 bolls, at 4 cwt. each boll: we are inclined to think, that a great proportion of the crops in Scotland, fall short of that average.

'Red clover, with a mixture of ryegrass, and sometimes 'with some white and yellow clover, and perhaps rib-grass, are 'the grasses almost universally sown in Scotland.' The introduction of red clover is justly reckoned one of the most fortunate circumstances that could have happened to the husbandry of Scotland; as, besides its own intrinsic value, it is also an excellent preparation for other crops.

Carrots are cultivated upon a very limited scale in Scotland, and principally by proprietors, upon some rich spot of land, which had previously been long in grass. They are given to cattle of all descriptions, and are uniformly found a sweet and wholesome food; but the weight raised per acre, being far inferior to any of the turnip varieties, prevents them becoming a general object of attention. This part of the work, however, contains some useful hints relative to the most approved modes of raising that root; and, in particular, we think the remark relative to laying the dung 16 or 17 inches deep, previous to sowing the seed, well worthy the attention of those who wish to cultivate the carrot.

Cabbages and Kale are very seldom cultivated in the fields for cattle; the former being considered the greatest scourger of the soil, of any of the Brassica tribe: And as to the latter, the weight it yields per acre is so trifling, that except to fill up blanks in turnip drills, it is hardly ever seen in the fields. One of the most intelligent agriculturists in East Lothian, however, has been in the practice of raising a small plot of kale, for ewes with early lamb: the gentleman in question considers them more productive of milk than the ruta baga, at that season of the year.

Rye is cultivated to a very limited extent in Scotland; though it is stated, on the authority of an intelligent Roxburghshire correspondent, that, upon moorish grounds, it is a more certain crop than oats. It is also remarked, that, like oats, it will answer on crude soils, without the application of calcareous manures, which renders that crop peculiarly calculated for waste lands, when first brought into cultivation. It may be observed, that the nature of the soil and subsoil, upon which it is recommended to sow rye, ought to have been more particularly noticed; because, upon all lands incumbent upon a wet and retentive subsoil, the cultivation of rye, through a series of years, will be found an unprofitable concern; while, on the other hand, there is no doubt that, in many situations where the soil is of the most porous and arid nature, that grain may be raised with more advantage than perhaps any other. The weighty crops of rye frequently to be seen along the sea-shore, upon almost pure sand, is a convincing proof how much that grain delights in a dry soil; and it is our opinion that, upon such soils, its cultivation is too much neglected.

Very little is said concerning the culture of Flax. 'It is supposed,' (says the author, page 286), 'that there are at least '5000 acres of flax raised in the country, producing above 20*l.* per 'acre, and consequently worth at least 100,000*l.*, besides furnishing the raw material for a most valuable manufacture.' We should suppose, that the value of this crop often falls far short of what is here stated; or, most assuredly, the extent of ground allotted to it would, long before this, have far exceeded the number of acres which it is supposed to occupy. It is indeed considered to be a very scourging crop upon most soils; though this will not, of itself, account for its limited cultivation.

The author introduces the section on 'the Rotation of Crops,' by observing, that 'of all the subjects included in the present 'inquiry, this perhaps is the most important and the most difficult to discuss.' And he proceeds to remark, that 'every 'farmer' (p. 287) 'must be aware, in fixing on his rotations, 'that it is necessary for him to ascertain, not only the various 'articles for the production of which his farm is calculated, 'and which are likely to yield him the greatest profit; but also 'the succession in which these articles ought to be raised, so 'as not to diminish the fertility of his soil; or, as Lord Kames 'has well observed, so to intermix his crops, as to make the 'greatest possible profit, consistently with keeping his land in 'order.' To this point we would wish to draw the particular attention of our readers; because we have observed that after neither labour nor expense had been spared in putting a field into excellent condition, a course of scourging crops, with

a view to reimbursement, has been commenced and continued, until, in a few years, the soil was reduced to its former sterility; whereas, had a proper rotation of white and green crops been adopted, the profits, though not so speedily obtained, would have been far more certain and abundant. The remark of one of the author's correspondents, that a crop ought never to be taken but when the land is in good condition, should at no time be lost sight of, though, especially at the commencement of a lease, it may not be always practicable to observe this maxim. A crop much below mediocrity, even though no rent was paid for the land, must, in the present times, be in general a losing business, when it is owing to the bad condition of the soil, and not the inclemency of the seasons.

In considering this subject, the following particulars are shortly discussed. 'I. The principles' (p. 289) 'or maxims on 'which rotations ought to be arranged: 2. The various sorts 'of rotations which have been adopted in Scotland, for various 'periods of two, three, four, five, or for a longer period of 'years: 3. Of double rotations, where two systems are in a man-'ner blended together, and carried on at the same time: And, '4. Any miscellaneous particulars connected with this branch 'of the inquiry.' The first of these particulars, we think, the Right Honourable Baronet has treated with great ability; and, from the clear and succinct manner in which he has stated his sentiments, it is obvious the subject has engaged his particular attention. As a proper knowledge of this branch of the subject is of the first importance to the success of the arable farmer, we particularly recommend this part of the work to the attention of those who are but partially acquainted with it, and about to engage in practical husbandry.

On the second head, or 'various Sorts of Rotations,' we consider the two years' rotation as practicable on few soils and situations, and applicable, with advantage, to perhaps a still less number. The three years' rotation is altogether objectionable as a general one over a farm; but its disadvantages are so great and apparent, that there is little risk of the practical farmer adopting that mode of cropping. Indeed the author, in mentioning the practice, has taken care, in the words of Dr Coventry, to give the proper antidote.

The four years' rotation is treated of in a very ample and satisfactory manner. 'The first pointed out is the celebrated 'Norfolk system, namely, 1. Turnips; 2. Barley; 3. Clover; 'and, 4. Wheat; which has been adopted in several parts of 'Scotland.' There are several other rotations, something similar to this, adopted in different parts of the country; such as, 1. Turnips; 2. Winter Wheat sown in spring; 3. Clover; and,

4. Oats. Upon the dry soils of East Lothian, there are some farms along the sea-shore, where, from the facility with which the exhausted fertility of the soil is recruited, wheat is taken every second year. Upon clay soils, 1. Fallow; 2. Wheat; 3. Grass; and, 4. Oats; is the course followed in many situations. In the neighbourhood of large towns, the rotation is, 1. Potatoes; 2. Wheat; 3. Clover; and, 4. Oats; but this is only calculated for the neighbourhood of great towns, where there is a ready market for the potatoes, and a great command of manure.

After mentioning the Norfolk rotation of four, it is observed, that 'this course is no longer so generally recommended' (p. 297). 'It is considered prejudicial to the landlord; and, on a lease of 'twenty-one years, if constantly persevered in, it would not be 'found profitable to the tenant. Half the farm has annually a 'white straw crop, which, from the frequency of the repetition, 'would not be productive; besides which, the number of sheep 'and cattle kept under this system is comparatively trifling. It 'is also much doubted, whether wheat will prosper so near the 'barley crop; and it can hardly be questioned, that, without a 'plentiful supply of extra manure, both the turnip and the clo-'ver crop will fail, unless the land is refreshed by grass for at 'least two or three years.' Now, we are almost certain, that these observations may be applied, with equal justice, to Scotland; for, satisfied of the soundness of the author's remarks when treating of the principles on which rotations ought to depend, we think that, 'by frequent repetitions of the same 'crops, the soil loses stamina, which neither manure nor cul-'tivation can renovate.' The only method, therefore, for renovating soils, exhausted by severe cropping, is to lay the land into grass for a few years; a plan which may be adopted with great advantage upon every kind of soil, and in every situation.

Several of the author's correspondents recommend a five years' rotation, differing, in some degree, in the articles that should compose that rotation. We are inclined to give the preference to Mr Charles Alexander's system, viz. 1. Turnips; 2. Grain; 3. Grass; 4. Grass; and, 5. Grain. As for those rotations that propose peas or beans to follow grass, they have little chance of ever becoming general in Scotland; for, as far as we have had an opportunity of learning the result of such a plan, the ground is generally in worse condition, and the profit not greater, than if the land had lain in grass; besides the additional expense and trouble of ploughing, sowing, and harvesting the crop. One general remark by Mr Mackenzie of Glasgow, in which Mr Curwen concurs, conveys a sentiment which cannot be too often inculcated—'*Grain should in general never 'be sown, but when the ground is laid down to grass, or plough-'ed from it.*' p. 306.

Among different plans for a six years' rotation, the preference is given, and we think with justice, to, 1. fallow; 2. wheat; 3. clover; 4. oats; 5. beans; and, 6. wheat; for strong lands. Upon dry grounds, potatoes or turnips should be substituted for the summer fallow. Upon very light soils, beans cannot be cultivated with advantage; besides, the wheat crop recurs too often. For such soils, 1. turnips; 2. wheat, barley, or oats; 3. clover, chiefly pastured; 4. and 5. pasture; and 6. oats or wheat; is the course deservedly preferred to every other.

We agree in the censure bestowed upon the seven years' rotation, viz. 1. potatoes and naked fallow; 2. wheat; 3. beans; 4. wheat; 5. barley; 6. clover; and, 7. oats: a system which, we believe, every accurate farmer will reprobate. At the same time, as the practice appears to be peculiar to a solitary individual, it was hardly worth the author's trouble to bring it forward as one of the rotations in Scotish husbandry. Perhaps, a private admonition from the Right Honourable President of the Board, might have had as good an effect in reclaiming the wandering brother, as giving him a public rebuke.

The term, 'Double Rotation,' is more fanciful than expressive; as the chief character of the system is, to allow every part of the farm successively to remain in grass for more years than it would do by the general rotation adopted. We do not, however, disapprove of the practice itself. The 'consequences 'must certainly be advantageous,' upon lands 'not naturally 'fertile and productive;' because, 'in the course of a 21 years 'lease, each division in its turn remains in grass for a period' of three, four, or five years, and is then brought in again to the rotation. p. 312.

The observations concerning what is *intended* to be done in Oxfordshire, even had the system been a judicious one, which we contend is by no means the case, are rather premature. Any notice of it might have been delayed until it had been carried into execution, and its advantages had undergone the test of experience. We have strong reasons for believing that the experiment will not be soon made; and, if made at all, that it will not be found to deserve praise, or general imitation.

It is remarked, p. 312, 'On the whole, however, unless in 'situations peculiarly favourable, or in the neighbourhood of 'towns, the six-course shift seems to be the preferable system.' Now, with all due deference to the author's extensive knowledge, we are inclined to believe, that the six-course shift is preferable chiefly in the situations here excepted; and we quote his own authority, taken from the very next page, in support of our opinion. 'On loams, 1. turnip or fallow; 2. wheat and barley; 3. clover; 4. oats; 5. peas or beans; 6. wheat.'—'This, on

'its proper soil, is a most productive rotation; and lands to 'which it is adapted will pay the highest rent. It can hardly, 'however, be long persevered in, except on very fertile land, 'assisted by foreign manure.' There are few situations, comparatively speaking, in Scotland, where the farmers can procure a full supply of foreign putrescent manure. Their only auxiliary, therefore, in this, as in other systems, is, to allow their land to remain occasionally in pasture for three or four years, according to the quality and nature of the soil. We urge this opinion with the greater earnestness, from a thorough conviction, that in all, even the best and earliest cultivated districts of Scotland, the refreshing and enriching of the land, by its remaining a few years in pasture, is by far too little attended to.

Section 7th, 'On the Sowing of Seed.' Here we find a number of judicious remarks, concerning the most proper methods of depositing the seed, according to both the drilled and broadcast systems. 'Some experiments,' says Sir John, 'made 'by Mr Hope of Fenton, East Lothian, are among the most 'satisfactory and decisive I have met with, on the subject of 'drilling.' page 321. To them, and the succeeding remarks of several very intelligent correspondents, we beg the attention of our readers.

'The following, on the whole,' adds the author, 'seems to be 'the result.

'That turnips and potatoes ought to be drilled in all cases. In 'regard to turnips, Mr Shirreff remarks, that the greater facility af'forded by the drill mode of culture, of simplifying and expediting 'hand-labour; the more regular and correct adjustment of the num'ber of plants to be left on a given surface; and the more equable 'admission and circulation of air among the plants in the drilled, 'than in the broadcast mode of culture, gives the former a decided 'preference.

'That drilling carrots is advisable, more especially where there 'is not a great depth of soil.

'That beans should be drilled, not only on light and loamy soils, 'but also on harsh, strong, and stubborn clays, otherwise they 'would in a manner be excluded from a soil which cannot be pro'fitably cultivated without them.

'That peas ought to be drilled in dry soils and climates, where 'the object is to clean the land; but in clays, if the land is clean, 'sowing broadcast, or in narrow drills, which prevent the bad ef'fects of wind, suits better the nature of that plant, in a windy 'climate.

'That autumn or winter sown wheat may be cultivated broad'cast; but that spring-sown crops, whether wheat, barley, or oats, 'are most likely to be productive upon light soils, where annual 'weeds abound, when cultivated in drills.' p. 323, 324.

In Section 8th, 'Of Weeding,' there is nothing either new

or important. The author, therefore, very properly, dismisses the subject in three short paragraphs; where it is remarked, that 'the practice of drilling turnips, potatoes, and beans, materially tends to keep those crops clear of weeds.' And that 'it is almost incredible how long seeds of an oily quality, as 'those of wild mustard, wild radish, wild marygold, broom, '&c. will remain in the ground; and yet, when acted upon by 'moisture, the warmth of the sun, and the force of manure, 'they will vegetate, and become strong plants.' p. 327.

Section 9th details at considerable length the different modes of Harvesting Grain in Scotland, where the crop is almost universally cut down by the sickle or hook; the scythe being very rarely used. 'To many of the more fertile districts, great 'numbers of Highlanders, both male and female, annually resort, 'to reap the crops, and receive a certain sum per day, and their 'victuals, for the work they perform. In the Carse of Gowrie, the 'harvest was formerly performed by men and women hired expressly for that purpose; the men at a guinea, and the women at 15s., 'for the harvest; during which time, they got a breakfast and dinner of bread and beer, and a small quantity of oatmeal for supper. At that time, the harvest used to cost about 5s. per acre, 'including all expenses. Some time after that, the harvest wages 'rose to 30s. for the men, and 20s. for the women, varying as the 'farmer and they could agree; but the expense altered according 'to the price of meal, and the length of the harvest, from a favourable season, or the contrary; and it has been as high as 9s. 'or 10s. per acre. About fifteen or sixteen years ago, some men 'came to the Carse as contractors, and agreed to cut down the crops 'at a certain sum per acre; but that plan did not continue long.

'About six years ago, another practice took place in that district, 'which continues to this day. It is called *threaving*, and now almost universally prevails. By this plan, the reapers are paid in 'money, without victuals, so much for every threave they cut down. 'For a threave of wheat, consisting of twenty-eight sheaves, each 'sheaf measuring 30 inches round, they receive 4d.; and for a 'threave of barley, oats, or peas, of twenty-four sheaves, each 30 'inches round, 3d. Mr John Shirreff remarks, that this is certainly on the whole the fairest mode of paying reapers, the reward 'being exactly in the ratio of the work done. It is evident, this 'can never be the case when a field is cut down either by the day, 'or the acre.' p. 329, 330.

The only objection (and with us it is a serious one) to this method of cutting the crop, is, that the interests of the farmer and the reaper are not reciprocal, any more than when the crop is cut by the piece or the acre; and from every thing we have learned or seen concerning this practice, we consider ourselves justified in saying, that, in many cases, the quantity of straw or stubble that is left upon the ground, and which,

with a little more time, might easily be taken off, would be nearly sufficient to pay the whole expense of reaping the crop. If, however, we saw such express stipulations for the height, which no part of the stubble should exceed, and found them steadily adhered to by labourers, as those insisted upon for the circumference of the sheaves; we should think this the most advantageous plan of cutting the crops in every part of the country. But, in truth, no stipulations will avail; the farmer, or some confidential servant must personally attend the labours of the reapers, and will often, after all, find it no easy matter to get the work properly executed.

It is observed by an intelligent correspondent, that 'the reaping process,' (p. 333,) 'taking every expense into consideration, 'cannot be duly and sufficiently executed under fifteen shillings *per* 'English acre; and when it can be done at that rate, the farmer 'may be satisfied.' This rate must however be taken as applicable to the situation in which the calculation is made, and to similar situations; for, in others where the work is equally well performed, though perhaps the crop is not so weighty, the expense of cutting and stooking, per acre, is much below this estimate.

The author, after recommending that stacks should be built on stone or cast-metal pillars, observes, that 'there is another 'invention' (p. 336) 'which I believe is peculiar to Scotland, called *bosses*, the nature of which the annexed engraving will explain. 'These, with cast-iron pillars, are admirably calculated for harvesting beans in wet seasons. The process is thus described. A tri'angle is first erected on the middle of the frame, which forms a 'boss of about three feet wide; railing must be nailed across the 'boss so close as to preserve the sheaves from falling into it; but 'when railing is not at hand, a strong straw rope is commonly used 'in its stead. After the builder has reached the top of the boss, he 'places therein a sack filled with straw, which, when he builds round, 'he pulls up until he reaches the top of the stack; so that by the vent 'left by the sack, the air reaches even to the top of the stack. Tho' it has been long the practice of attentive farmers in a bad harvest to build stacks of every kind of grain, when in a doubtful state, with both an upright central and cross funnels, the benefits of which are generally known, the same care to preserve the stacks from the admission of vermin has been but too often neglected, though the losses occasioned by their depredations, especially at an advanced period of the season, are every year felt and acknowledged. Yet, highly beneficial in a late wet harvest as these standards and funnels certainly are, it is still better, in favourable weather, to allow the grain to remain in the stook until every reasonable apprehension of danger from dampness or moisture be completely removed. To have stubbles rough and foul, and to spoil the crop by hurrying it too soon in-

to the stackyard, are two practices that cannot be too strongly reprobated.

In section 10th we have a few remarks 'on Thrashing Grain,' which might have been as well inserted when treating of the thrashing-mill, in the first chapter. The author, in section 11th, discusses the much and justly celebrated practice of soiling,—of feeding stock in summer with cut green food, instead of sending them to pasture. 'The soiling of horses,' he observes, 'was known in Scotland about 50 years ago. It was 'practised, however, but by a few; and it was not till about 'the year 1778, that the system of regular soiling took place in 'East Lothian.' This subject having been satisfactorily explained in former Numbers of this work, it is unnecessary to detain our readers by going into all the particulars brought forward by the worthy Baronet in support of the advantages of the practice. Great and obvious as these are, when carried to a moderate extent, we do not think the practice ever can, with propriety, be carried to the length some people recommend. For if, in all situations, without the reach of the aid of foreign manure, it will be found proper and necessary to refresh the land by several years pasturing, it is evident, that this system, if carried to a great extent, cannot at all times, be a profitable one; as experience has clearly shown, that when grass is cut the first year, the value of the land for pasture afterwards is greatly diminished.

It will be said, perhaps, that the additional supply of dung obtained by soiling will preserve the land in good condition, without the aid of foreign manure. But first it must be considered, and the words of the author have been already quoted in support of this opinion, that there are cases where 'neither 'manure nor cultivation can renovate the soil;' and second, we would wish to know how soiling, to any considerable extent, can be carried on upon a turnip farm, when it has been admitted that little straw can be reserved for the summer months. What dung can be made upon such farms is all required by the turnip fields in the month of June. We know that in some districts, and even upon turnip farms, a great many stacks of grain are to be seen in the yards through the summer; but they are kept on for a very different purpose from that of reserving straw for soiling. We are aware how much we expose ourselves to censure by such remarks; but we must be excused for expressing a conviction, that in agriculture there are yet very few practices that can be advantageously adopted on all soils, and in all situations; and that, in recommending this practice, which is particularly valuable on farms where turnips cannot be cultivated, it is quite necessary to except arid, weak soils, upon which it never can be carried to a considerable extent. We shall not at

present examine whether land is in a better state for producing a crop of grain, after two crops of grass have been cut and carried off through the summer, than if it had been pastured by sheep, at the rate of from five to seven, perhaps, to the acre; but we may venture to assert, that the best friends to any improvement in husbandry, and this is certainly a very important one, are not those who admit no qualifications nor exceptions, but urge its adoption in every situation; unless indeed (a very necessary exception), when the first or second crop cannot be cut at all, from the poverty of the soil, or the extreme drought of the season. A very intelligent friend, to whom we are much indebted for his judicious observations upon other subjects of this Article, who has had considerable experience, and examined its details with much attention, has favoured us with some remarks upon soiling, which deserve consideration. We readily admit that tares, if the soil and season are favourable, may in a great measure obviate the complaint of the hardness and want of nutrition in the grass. But it is well known that tares, like peas, or indeed any pulse crop, are more precarious than most other crops; and were the soiling system carried to the extent that it is now the fashion to recommend, and should this crop fail, we leave our readers to judge what would be the consequence if, as in the case of the horses, a feed of corn, or some equivalent, should be required to maintain a number of cattle in the same condition only as if they had gone to pasture.

'During the month of June,' writes our correspondent, 'when the grass is fresh and succulent, I believe that black cattle will feed as well, and that horses will do as much work, as 'when either of those are allowed to pasture in the fields; but 'after that, the grass gets hard, and to all appearance less nutritive. It has been uniformly found after that period, that 'work horses require at least one feed of oats per day when 'upon cut grass, to keep them in the same condition as others 'in a pasture field, although the work of both is in every respect alike. This remark is indeed in opposition to the general sentiments of Sir John's volume, but I am convinced, 'that, were it not for some inherent defect in the system, the 'farmers in Scotland are by far too quicksighted to their own 'interest, not to have adopted it, as the only means of consuming all their grasses, long ago.'

Section 12th, 'On the system adopted in Scotland with regard to permanent pasture.' This important subject is discussed at considerable length; and a great deal of ingenious argument is brought forward by the author's correspondents in support of their respective opinions; some contending that it is

of the utmost importance to have a small proportion of old grass attached to every farm, while others, with equal ability and resolution, insist that it is perfectly unnecessary. Part of the arguments are evidently fallacious enough, at least a great deal more specious than solid; and some of them are not entitled even to this distinction; but men are ever ready to overstep the bounds of discretion when keenly contending for any favourite theory. It is unnecessary, here, to enter into all the arguments so positively advanced on both sides of the question. The following extract will show the conclusions drawn by the Right Honourable Author, from the whole of the investigation.

'1. I certainly think, that it is highly desirable to keep one or two 'moderate-sized enclosures, containing from 10 to 20 acres, according 'to the size of the farm, near the residence of the farmer, in grass, 'for the feeding of cattle and sheep, provided the soil be naturally 'calculated for it, or is thoroughly drained and improved by ma'nure and cultivation. The utility of this measure is acknowledg'ed by almost every one of my numerous correspondents, without 'admitting, at the same time, that such field or fields should never 'be broken up, or that the same part of the farm should always re'main in grass.

'2. Where the finer sorts of sheep are bred, it is contended that 'it is necessary to have some old turf, where the ewes may drop 'their lambs, and where they may be fed with turnips, or any other 'article in the spring season. But old turf is quite unnecessary for 'either of those purposes; Mr Rennie of Phantassie, and Mr Brown 'of Markle, having ascertained by experience, that on dry land 'which is the only proper kind of soil for ewes to lamb upon, grass 'of two or three years old is as good as that of twenty.

'3. It is likewise contended, that it is necessary to have some old 'turf, as a resource for the stock to go on, in case of any spring or 'summer uncommonly dry, such as happened in the year 1810, 'when it was a long time before the artificial grasses made their ap'pearance, or could be either cut or pastured. On loams, however, 'artificial grass may always be pastured earlier than old turf, unless 'in seasons when uncommon wet weather prevails; and other sub'stitutes have been already suggested.

'4. Lands apt to be overflowed, or which have been converted 'into water-meadow, it is evident, cannot be cultivated for grain 'crops; and there may be *some very rich old meadows*, which it 'would be desirable to preserve in the dairy districts.' p. 390–391.

At the beginning of this section it is observed, that there is perhaps no particular, in which the systems of husbandry adopted in England and Scotland differ more than in regard to permanent pasture; and in the above extract, it is clear that the author considers permanent pasture, with a trifling exception, as unnecessary. In the concluding paragraph of the section, it is pronounced, in general, to be injurious to the land-

lord, the tenant, and the public; whereas, by the adoption of the convertible system of husbandry, it would be an easy matter to double the value of any estate,—an estate, it is presumed to be meant, where the system of permanent pasture is adopted. As no instance of this kind is to be found in Scotland, this observation, of course, must apply to England. When we come to that part of the volume that professes to point out a plan for transferring the husbandry of Scotland into England, we shall then endeavour to show the little probability there is of this part of the agricultural system of the former country ever being extensively imitated in the latter. The great bar to the introduction of this lucrative system, is not so much as even hinted at in the volume before us.

In section 13th, on Hay-making, a severe censure is passed upon the farmers of many parts of Scotland, for their slovenly conduct in this important process. We fear there is too much truth in the accusations brought against our husbandmen in this particular; and should therefore be happy to learn, that they, like dutiful children, have received, with all submission, this fatherly chastisement, and that their future conduct has proved that it has not been bestowed in vain.

The following method of hay-making ought to be generally known.

'It is proper to make *the tipple* as soon as the grass is mown, if 'dry; if not, it is better to wait till it is so. If the crop is strong, 'there is a row of tipple placed on each swathe; if light, two of 'these are put into one row. In making one, a person with the 'right hand rolls the swathe inward, until he has a little bunch; 'then the same is done by the left, until both meet and form 8 to '12 lib. weight or thereabouts. This bundle is set up on end against 'the legs, or between the feet. A rope is twisted of the grass, 'while the bundle is supported in this manner, which is tied round 'the bundle near the top of it; and from the top are drawn up a 'few straggling stems, which are twisted to make the tipple taper 'into a point, and give it as much a conical shape as possible. After standing a few hours, they become so smooth on the outside, 'that the heaviest rains seldom wet them through, and, when wet, 'they are soon dried again. As soon as ready, they are put into 'the summer rick, or even the winter stack, if very dry; but are 'never opened out, or ted, to make them dry, as they never require it. By this method not a leaf is lost, and the hay is nearly 'as green as a leaf dried in a book. In a moderate crop, one woman will tipple to one mower; and a woman will rake to two tipplers or two swathes. But where the crop is strong, it may require three women to keep pace with two mowers. After the hay 'is put up in this manner, the crop may be considered as secure,

'though it may continue wet weather for a considerable length of 'time.' p. 401–2.

In the conclusion of this First Part of the volume, 1st, A General View of the different particulars is given; in which the excellence of the Scotish System of Husbandry is supposed to consist; 2dly, The improvements of which it is still thought susceptible, are detailed at considerable length;—As these two articles consist either of a recapitulation of the particulars that had been discussed in the preceding sections; or of remarks, which, though highly deserving of attention, do not present much novelty, we shall not detain our readers with any extracts or observations; and, 3dly, The means of disseminating the useful practices of the best Scotch farmers, in the less improved districts of England and Scotland, are pointed out; with a view of the public and private advantages thence to be derived.

After a few short preliminary observations, the following particulars are condescended on, as applicable to both landlord and tenant.

'In regard to the landlord, the following particulars will require 'his attention:—The farm ought to be of a proper size, and not less 'than from 300 to 500 English acres;—The rent ought to be such, 'as to enforce industry and exertion, and not so low as to encourage 'indolence;—The leases, to a farmer in actual possession, ought to 'be granted for 21, and to a stranger for 25 years; for the latter 'is entitled to expect additional encouragement, if he comes from 'any distance;—The covenants contained in those leases, ought to 'be fair and even liberal;—The farm-buildings should be placed in 'as central a situation as possible, and the house and offices should 'be made convenient and comfortable;—The formation of good 'roads, to be considered the most essential of all improvements, 'and as the surest means of adding materially to the value of an 'estate.

'As to the tenant, it may be proper to keep the following particulars in view:—The farm should be divided into fields of a proper size, and the ridges formed of a proper length and breadth, 'suitable to the soil and climate, and to the nature of the course of 'crops to be adopted;—The lands should be ploughed as deep as 'the staple of the soil will admit of;—The ground should be kept 'thoroughly clean, by fallowing or drilled crops;—Turnips, potatoes, and beans, ought always to be drilled, hand-hoed and horse-hoed; and some intelligent Scotch farmers maintain that peas, 'and all crops of grain sown in spring should be drilled also;—Two 'white crops of grain in succession not to be permitted;—A thrashing-mill and fanners ought to be considered as indispensably necessary on every farm;—Two-horse ploughs ought to be preferred, and swing-ploughs (without wheels), except in so peculiar

'a soil as that of Norfolk;—Single-horse, or even double-horse 'carts, ought to be used, in preference to waggons, as infinitely 'better calculated for the purposes of a farmer;—To lessen the ex-'pense of farming, economy in the feeding of horses ought to be 'particularly attended to; and, where circumstances will admit of 'it, the breeding of horses necessary for the use of a farm, instead 'of purchasing them at high prices from other districts;—The system 'of soiling horses and cattle ought to be adopted, which diminish-'es the expense of their maintenance, and increases the quantity of 'dung;—A greater extent of land ought not to be kept in perma-'nent pasture, than is absolutely necessary for the uses of the farm; 'The dung used on a farm, ought either to be put in the furrows, 'or centre of a drill, or so deep, that it will not be liable to be ex-'haled by the sun.' p. 420—422.

The various particulars enumerated above, certainly merit the attentive consideration of both landlord and tenant, in every district of the island. But, the observation relative to permanent pasture, is by no means applicable to England, under her present circumstances: For, while tythes, that scourge of convertible husbandry, continue to be drawn in kind, it is pretty clear, that land of almost every description, will afford at least as much rent, if not more, when lying in grass, than if it was brought under the plough. Common prudence will therefore generally lead the landlord to decline giving liberty to the tenant to break up old pasture, in which state there is not the same danger of deteriorating the soil, as when it is brought under the plough. As to the tenant, it is not to be expected that he will be anxious to bargain for liberty to break up old grass at a high rent, when he is so well aware of the teazing and procrastination—the heart-burnings and bickerings—that so frequently take place in adjusting the proportion of produce that falls to the share of one who neither contributes any portion of the rent, nor expenses of cultivation; more especially when, by occupying the same fields as a grazier, he can find full employment for his capital, and obtain, in this way, a reasonable profit from it, uncontaminated by the touch of a stranger, too often unfeeling and rapacious.

In mentioning the different circumstances which have contributed to the excellence of Scotish Husbandry, the author notices particularly, that wherever there is any uncertainty in regard to the sums to be exacted, especially if *the burden increases with the industry exerted*, evidently alluding to tythes, no farmer will attempt any expensive improvement. Now, with this conviction, which every man at all acquainted with the subject must feel and acknowledge, we are surprised that the breaking up of old pastures should be so earnestly recommended to both landlord and tenant, without any attempt to remove—without even any fur-

ther allusion to, the insuperable objection, that a considerable part of that produce which ought to go as rent to the one, and as a recompense for capital and industry to the other, is seized by a stranger, totally unconnected with either.

In the perusal of this most valuable treatise, nothing has so frequently and so forcibly pressed upon our attention, as this extraordinary circumstance. Until the farmers in both parts of the Island are placed as near as may be upon a level by the laws of the country,—at any rate, while the disparity continues so great as at present, it is idle to expect—it is unreasonable, to say no worse of it, to demand, that the English farmer shall adopt the improved practices of his northern neighbours;—practices which the latter themselves would not adopt, were they in the situation of the former. In a work which has for its object 'to disseminate the useful practices of the best Scotish farm-'ers in the less improved districts of England,' a change in the laws respecting tythes and poor-rates should have been stated to be a previous indispensable measure. Delicate as such a discussion must be, and difficult as it is to point out a plan which shall do equal justice to all parties, the present circumstances and future prospects of this country, and of Europe, imperiously demand an alteration of these laws. With a population rapidly increasing, a great portion of which has been periodically exposed to the dangers of famine, even though the wealth of the nation is lavishly transferred to our enemies, and furnishes them with the only means of warfare of which they are in want, it is full time that we should avail ourselves of those internal resources which a kind Providence has liberally placed within our reach. Though the population of Great Britain and Ireland were more than doubled, the produce of our fields might be rendered sufficiently adequate to their subsistence. It is too much to say, that these resources must be for ever locked up, because one class of society, however useful and respectable, might suffer by a commutation of tythes. But will that class indeed suffer by this measure? Do we wish to sacrifice their interests even to the public welfare?—By no means. In fact, the infatuated inattention of successive governments to the interests of agriculture is, in a very slight degree, to be traced to any regard to the interests of the Church; as we shall have occasion to show, before we finish our remarks upon this treatise.—Though we cannot avoid stating that the author, from his high rank in the State, his official situation at the head of the Board of Agriculture, and the particularly favourable opportunity which this work presented, might have been expected to have gone into a temperate discussion of this important subject, as a necessary prelude to the extension of those beneficial practices which he

has so judiciously illustrated, and so forcibly recommended; yet we do not the less respect the motives which have induced him to avoid it. Yet we must regret that so much weight was attached to them, while he justly observes (p. 430), that '*the prosperity of this country can never be insured until it can feed itself;*' a truth that cannot be too deeply impressed upon the mind of every member of the community.

We can at present only notice the *Addenda* to this First Part of the work, which consist of articles that had been subsequently transmitted to the author. These communications are entitled, 1st, 'A comparison between the advantages of feeding cattle with potatoes and turnips.' 2d, 'On the culture of rape, instead of a summer-fallow on thin clay soils.' 3d, 'Farther information from William Hunter esq. of Tynefield, regarding the experiment he tried of folding sheep, and feeding them with turnips.' 4th, 'A more particular description of Mr Charles Alexander's dung-pit.' 5th, 'On grubs and caterpillars.' 6th, 'On the advantages that would arise from the discovery of a reaping machine.' And, 7th, 'Account of Mr Hunter of Tynefield's system of farming, on the principle of converting all the straw of a farm into dung.'

The Second Part consists of three Dissertations. I. 'On the size of farms, and on the various modes of occupying allotments of land for farming, and other purposes of a similar nature.' II. 'Of the circumstances connected with the establishment of a liberal system of connexion between the landlord and tenant.' And, III. 'Of the various description of persons employed in agricultural labour in the more improved districts of Scotland.' The work is concluded by an Appendix, containing eleven different articles; and an explanation of the plates presented in the volume.

It is intended to give a short account of this second Part, and Appendix, in next Number. In the mean time, we must express our dissent from the covenants proposed by the author to be inserted in leases; upon which some observations will then be offered. Several of them appear to be unnecessary, and others even illiberal, if not oppressive, to the tenant. We allude to this subject at present; because if any proprietor should feel inclined to adopt the recommendation of the author to grant leases, it is at least possible that he may take these covenants as a model. Against such a measure we must publicly, though most respectfully, protest—'for reasons to be lodged in due time.'

BRANCH

BRANCH III.

Agricultural Intelligence.

The remarkable coincidence of our reſpectable Reporters, on all the principal topics of Rural Economy for the laſt three months, renders it unneceſſary to offer any extended remarks on the agricultural operations of that period. This agreement, placed as they are in ſituations very diſtant, and without any opportunity of learning each other's ſentiments, is at once a proof of their fidelity, their judgment, and practical knowledge of their profeſſion, which entitles their communications to a high degree of reſpect and confidence.

The change of weather which occurred about the middle of March —its continued ſeverity, which poſtponed the labours of the ſeaſon until the firſt week of April—the dry, keen, froſts which prevailed from that period to the 25th of the month—the total abſence of vegetation even till the ſecond week of May, and its rapid progreſs ſince—are the general features of the weather for the laſt three months, and are univerſally recognized. But it gives us pleaſure to ſtate, that the alarming apprehenſions of many people, in the months of March and April, are now proved to have been altogether groundleſs. The ſeed has been depoſited almoſt every where in a dry bed, and ſufficiently covered by harrowing, which the pulverization produced by the froſt greatly facilitated. The conſequence is, that, though ſomewhat later than is uſual at this ſeaſon, the winter wheats and ſpring crops, with very few exceptions, and alſo the hay fields, and even (within theſe few days) the ſpring-ſown graſſes, have aſſumed a very favourable appearance, ſince the commencement of the preſent genial weather.

In ſituations where a ſufficiency of turnips had been raiſed, or could be procured, by thoſe farmers whoſe chief dependence is upon live ſtock, the high prices of their fat ſheep, and alſo of their fat and lean cattle, may have indemnified them for their loſs of lambs, by which, indeed, from their command of food, they ſuffered comparatively very little. But the loſs of lambs, and even of old ſheep, in other diſtricts, muſt be ſeverely felt. In ſome places, one half, in others, one-third of the whole lambs have periſhed; and this at a time when ſtore-farmers can with difficulty convert their wool into money at any price.

The rent of graſs parks, as well as of farms for a leaſe, ſeems now to be ſtationary, if not rather inclined to a retrograde movement. This circumſtance, as it reſpects the former, is accounted for by the preſent high prices of ſtock for grazing;—in regard to the latter, the cauſe is ſufficiently obvious.

The great extenſion of the cultivation of potatoes this year, we believe, in every part of the Iſland, muſt be highly beneficial, in the firſt inſtance, to the labouring poor, and we hope not ultimately injurious to the interests of the farmer, who, if the market is overſtocked, as it probably will be for a time, may find various profitable ways of conſuming, or diſpoſing of them, before the month of May.

As our usual limits must be exceeded, we shall refer our readers, for prices and other particulars, to the reports themſelves; and offer a very few remarks of a proſpective nature, which the preſent ſcarcity and high prices of all kinds of grain ſeem to demand.

On this ſubject, indeed, our Reporters entertain oppoſite ſentiments. Some conceive that the ſcarcity is artificial or imaginary; and that the high prices were occaſioned by the alarm produced by the ſeverity of the weather in March, April, and part of May, and the conſequent lateneſs of vegetation; but that, now, when the ſeaſon is uncommonly propitious, and has already produced a moſt favourable change in the appearance of the crop, prices will ſpeedily reſume their accuſtomed level at this period. Others contend, that the ſcarcity is real, and proceeds from the great and acknowledged deficiency of laſt crop, and from the uſual conſumpt having been too long continued; becauſe, till the month of March, it was not diminished by any considerable advance of price. In one point both agree, that the stack-yards are generally empty; and that there is little or nothing more of the last crop in the hands of farmers than will be required for their own consumption. From all the information we have been able to procure on the subject, we are led to conclude, that the rise or fall of prices during summer must solely depend upon the prospect of an early or late harvest, and its probable abundance or deficiency; and that the present high prices will, with occasional fluctuation, be supported for some weeks, or until the prominent character of the season can be more decisively ascertained. When a probable conjecture can be formed respecting next crop, a very considerable rise or declension of price may be confidently predicted; because, though the prospect should be that of a medium crop only, the extended cultivation of potatoes, which will begin to be used about the same period, must speedily reduce the prices of grain, at least for some time. Should the next crop, on the other hand, prove much below an average one, we dare not contemplate the consequences.

But whatever opinion may be formed on the subject, it must be admitted by all to be prudent and necessary to provide as far as possible against the worst; and, in the mean time, to diminish the privations of the labouring poor as far as circumstances will permit. With this view, we earnestly recommend to the attention of our readers the following extract from the letter of an intelligent and benevolent friend, received a few days ago.

'We are not ignorant, however, that here, as in other places, 'some must feel; and we trust it will not be considered out of 'place to enforce the imperious call, from the pressure of the 'times, on both high and low, to practise a rigid economy, as 'the best, perhaps the *only* resource left, to meet the exigencies 'of an increased population till the return of harvest. The pe'riod of this may be late; the prospects of plenty still must be pre'carious; the means of foreign supply, if not entirely cut off, must 'be purchased with difficulty, and at an exorbitant price. Econo'my, therefore, in the strictest acceptation of the term, both from

'moral and political considerations, becomes a duty equally ob-
'ligatory on the rich and on the poor. Thus may the former, without
'any inconvenience, be enabled to alleviate the hardships of the lat-
'ter. And it may be proper to add, that the loyalty and good sense
'of the lower orders, here, and in general through Scotland, at a
'time when other parts of the kingdom have been so much agitated
'and alarmed by riots and combinations, justly entitle them to such
'kind treatment on the part of their superiors.'

We beg leave also to refer our readers to the Agricultural Survey of Aberdeenshire, by Dr Skene Keith, which contains several useful observations respecting the most economical use of food. That gentleman seems to have paid much attention to the subject; and his valuable directions, founded upon experience, may be advantageously perused by all classes of society. Ample extracts from that part of the work, will be found in the last Number of this Magazine.

But something more is necessary than temporary expedients to meet an evil of so dreadful a nature, which has recurred so often, and which, in all probability, will continue to visit us at shorter intervals. The consequences of a scarcity and dearth must, after every subsequent deficiency of crop, become more and more deplorable. Even the General Enclosure bill now before Parliament, though it should pass into a law, will not insure a supply of food adequate to the increased and increasing demand. In fact, a considerable alteration must be effected in the English Statute Book; and, above all, very different sentiments respecting the comparative advantages to the country of manufactures and agriculture, must be deeply impressed upon the minds of our Rulers, and generally prevalent with the public at large, before the produce of Great Britain shall be rendered equal to the wants of a rapidly augmenting population.

The Review of the Second Part of Sir John Sinclair's Treatise on Scotish Husbandry will afford an opportunity of going a little farther into this important discussion in next Number, when it will be seen in what light two of our *quondam* sage rulers considered Agriculture as connected with Political Economy; and whether, in the words of the worthy and patriotic Baronet, these men thought with him, that 'the prosperity of this country can never be ensured 'until it can feed itself.' It is not improbable that, in the estimation of such politicians as those with whom this country has long been blessed, the labours of the agriculturist are, in point of real importance to society, upon a level with those of their tailors and hairdressers. So far, however, from thinking meanly of the two latter professions, we agree with probably nine-tenths of the population of the kingdom in the opinion, that, though a 'consum-'mation devoutly to be wished' for the best interests of the country, the professors themselves would not be much honoured by the admission of such members into their fraternities. There is, indeed, a very serious obstacle to such an improved arrangement in the division of labour. Many of these Right Honourable Gentlemen have contrived, notwithstanding the unparalleled pressure and peril of the times, and without any labour at all, to obtain possession of *places*

affording them incomes fully as considerable as they might acquire by a steady application to the duties of the needle or the razor.

SCOTLAND.

Upper Annandale Quarterly Report.

For many years there has not been so much hazard and difficulty in maintaining the stock of cattle and horses, as in the present year. Many were at the lifting, and a few have died for want of provender. The hay was indeed good, and more than usually abundant; but the straw failed in quality and quantity to an unexpected extent.

Of late, however, the weather has become so mild and favourable, that the pastures are well covered with grass, and the stock have been most seasonably and effectually relieved. There is little or no hay indeed for them. Farmers cannot, as usual, maintain their horses in the stable, but are obliged to send them to grass, and to accommodate their labour to this mode of keeping; distant carriage being out of the question. It is now very difficult for carriers and others, who have horses on the roads, to find maintenance for them, neither hay nor corn being easily obtained, even at exorbitant prices.

The crop of lambs has been greatly reduced by the cold and late spring, which deprived their dams of food and milk, and, of course, rendered them unnatural. The death in lambs has been considerable; and even the black-faced and hardy breed have materially suffered.

Most farmers have eaten down their sown grasses; and in all probability the hay cannot be very abundant when the ensuing crop is collected. But in places where sown grasses have been properly put in and well preserved, they now appear to great advantage; and those of the first quality begin at present to be cut for soiling.

Prices have been very encouraging to the farmer. Year-old cattle, of the ordinary quality, sell at 5*l.*, and cows at 14*l.* each. The sheep markets have also been good; and lambs run to about 14s. over head, in good pastures, for the butcher. Oatmeal is now up at 5s. per stone; and oats for the road in such demand, that 7s. per bushel have been given.

The young braird, however, promises so well, that if our foreign relations can be at all adjusted, a material decline in the price of grain may be soon expected.—*2d June.*

Letter from a Correspondent near Annan, 21st May.

'We have had a very wet winter. March was boisterous, with much rain, and very unfavourable for spring labour. Very little land was ploughed in good condition in that month. The month of April was more favourable for committing the seeds to the ground, being mostly dry and cold, with frosts at night, which have rather hurt the wheat crops; and it ended with cold easterly winds, and little appearance of any grass. Every article of provision experienced a sudden advance in price. Oats, that sold through the winter months at 11s. to 12s. per Carlisle bushel of three Winchesters, are now selling at 20s. Oatmeal is 5s. per stone, and very scarce. Wheat 40s. to 45s. per three Winchester bushels. Pota-

toes 4s. to 5s. per cwt. of 112 lib., and are likewise a scarce article. The markets are poorly supplied with butcher meat, few cattle having been fed this season, as the farmer was paid nothing for his turnips last year. Feeding of swine has paid the farmer little, owing to the high price of victual, and the price of pork not being adequate to that of their food.

'Sometimes one's loss is another's gain. The bacon-mongers will be well paid by manufacturing pork this season. Their inlay price was from 5s. to 6s. per stone of 14 lib.; and the dried bacon is now selling at 8s. and small hams from 9s. 9d. to 10s. per stone; and there is no doubt of its advance, as all other provisions are high. This, however, I hope will greatly encourage that lucrative branch of stock in this country; and that the example will be the means of setting our North country neighbours to work in adopting a trade where so many preferable advantages appear in their favour, the particulars of which are described in a late Treatise on Swine, already noticed in your Magazine. There is but little demand for store pigs at present. If the new crop of potatoes prove a good one, there will be a considerable demand for young swine after harvest, as many of the breeders have been destroyed; and the high price of bacon and hams will encourage both farmers and the bacon-mongers to carry on that branch of business. I would recommend it to every swine-feeder who lives near the shores of the sea, where sea-weed may be had, to gather as much of it daily as will support their swine in the ensuing summer, where other provision is not to be had. The swine will eat it just as it is gathered from the shores; but it will answer as well boiled with a little mixture of potatoes, or even the skins of potatoes. Barley-dust, wheat-bran, &c. mixed with it, make it a most excellent food, and will not fail to put the animals in good condition. It must be allowed, that salt forms a valuable ingredient in the food of every species of domesticated animals. We feel how comfortable salt is to the human race. I have often observed, when salt has been used in the feeding of swine, that their skins become more soft and shining; consequently, it must be a good ingredient for fattening. The high duty on salt prevents domestic animals from enjoying the benefit of that nourishing article; but Government has not, as yet, imposed a duty on the sea-weed. Those who have the good fortune to live near the sea-shores, where this weed is thrown out by the high tides, may avail themselves of that opportunity of salting food for both cattle, horses, and swine. In the season for fattening swine, take one half potatoes, and the other half sea-weed, and boil them up together; which method, I am convinced, would be a great saving, and at the same time salt the food. Cattle are equally fond of it as swine are; and it is as nourishing to the one as to the other. It will be observed, on the shores where this weed grows or is thrown out, that black cattle will leave their pasture, and resort to the sea-side, and pick up the weed. I hope these few hints will encourage those who live upon the sea-coasts to make a trial; for I am certain of its utility; and should be happy to see an account of its success appear in your Magazine at some future period.

'There has been a considerable demand for straw-yard cattle this spring to the South country markets, which have paid the farmer in a fair way for his turnips and straw.'

Dumfries-shire Quarterly Report.

THOUGH the frequent storms and wet weather, in the winter and early part of the spring, retarded the operations of the plough, yet the season, in March and April, became so suitable for that purpose, and the land so dry, that the spring seed-corn was sown with great expedition. The progress of it since, shows that the grounds were in the most perfect state, and the seed of sound quality; as the braird came up, and is now tillering, in a manner so promising as has scarce been remembered. The wheat stood the winter well, and is now unusually strong and healthy. The extent of the corns now growing, and of the potatoes planted, has not been exceeded; and if the present genial weather continues for a few weeks, with an ordinary sunshine in July, an early and abundant crop may reasonably be looked for.

The deficiency of last year's crop of oats and barley, was not understood in the county till far in the spring. Then only it was that the price of oatmeal exceeded 3s. the stone. It has since risen to 5s., which it is hoped it will not exceed; and it is not doubted but there is a sufficiency in the country to serve till the new crop comes in. Potatoes are also scarce, being now so high as 4s. the cwt. The last crop of these could not be reckoned deficient; but the number of swine fed upon them in this county was greater than usual. Hence an erroneous idea took place, that swine should be lessened, to make potatoes plenty; but those acquainted with the history of the increase of swine and potatoes in this county, know it was the former which occasioned the generally superabundant quantity raised of the latter, which admits of their being sold here at a lower rate than in any other county of the kingdom.

The dry and sterile weather in March and April, and the failure of the last crop of corn fodder, occasioned a considerable scarcity of both hay and straw; but the country is now about being relieved in that respect.—The price of cattle kept high through the spring, and continues so; and for sheep the demand is good.—Present price of Oats, 6s.; Barley, 8s.; Wheat 16s.; the Winchester bushel.—*May 30th.*

Inverness-shire Quarterly Report.

THE early part of the spring was open, and well calculated for forwarding farm labour; so that the ploughing, and part of the oat-seed, was in a state of forwardness seldom to be met with in this county. The labours of the field were fast advancing, when a sudden stop was put to them, by a fall of snow on the 14th of March, which continued until about the 2d of April; when, from the length of the day, and the heat of the sun, the snow began to clear off the fields, and the spring labour again commenced in the low country; but the progress was slow, as the frost was still hard in the mornings; and the day was far advanced before the harrows could make any impression on the ground. The oat-seed was finished in the low

country about the end of April, and in the high lands about two weeks after; the frost still continuing so intense, that no snow left the ground but what the length of the day and the influence of the sun dissolved, until the 8th of May, when a thaw came on, with fine refreshing showers. Until that day, the hills were covered with a close mantle of snow, which has been severe on the lambing season; and great losses have been sustained by many of the store farmers in the Highland districts: It is supposed that more than one half of the lambs are dead. Their straw was nearly all consumed when the storm came on, and many of them were reduced to great straits, having to purchase hay from the low country at 1s. 6d. per stone of 21 lib. Dutch, and to carry it for 10, 15, and some, 20 miles distance. The oats sown after the snow went away, will be very little behind those sown before it, as there was little or no vegetation until the 8th instant; since when, every thing has made a fine appearance. The wheat, in most cases, is looking fresh and vigorous. The oats have a close and equal braird, owing to the land being so well made with the frost, that great justice was done to the fields in harrowing. The barley and potatoes, in most cases, were finished about the 20th instant in good order. The latter are planted very extensively;—as they are the principal support of the working class here, they are very much depended on. Little loss has been sustained by rot in the turnips this season, which has enabled those that have feeding or rearing stock on hand to bring them to a good market. Beef is from 7d. to 10d. per lib.; Mutton from 7d. to 9d. per lib. of 17½ ounces; Wheat 3*l.*; Barley 2*l.* 8s.; Oatmeal 2s. 2d. to 2s. 8d. per peck of 9 lib. Dutch. The drovers are buying keenly at fair prices for the farmer. Land still continues to rise in price, though not so eagerly sought after as some years since.

As the high prices of grain do not proceed from a scarcity in the country, but from a dread of a bad crop, from the backwardness of the spring, which prevents the stock on hand from being brought to market, if the present favourable weather continues, it is expected that the prices will soon be back to their old level.—23*d May.*

Kincardineshire Quarterly Report.

NOTWITHSTANDING the favourableness of the preceding winter, a more ungenial spring has not visited this district these many years. Only till of late, I may say within the last two weeks, was there a single day which could have merited the appellation of being wholly fresh from morning to night. The mountains continued almost closely covered with snow, which at different times accumulated to a considerable depth, especially on 25th April, while a sharp breeze blew almost incessantly and invariably from the same quarter. A complete barrier was thus opposed to vegetation; at the same time, the consumption of fodder was augmented; and, as this article was greatly, indeed almost universally, exhausted, the scene was rendered truly affecting. However, on the other hand, these grievances were in a great measure counterbalanced, by a dry seed-bed being afforded for *all* the oats, and a great part of the barley. The

soil, in fact, never wrought more freely, and in better style; but, owing to the continued inclemency of the weather, sowing did not commence so early by three weeks as last year. Nevertheless, that process, from the unusually advanced state of the preparatory operations, was soon accomplished; at least, with the exception of what barley remained unsown on the 9th current. Since that period, there have fallen some very profuse showers of rain, which had the effect of retarding the completion of this process beyond expectation. However, it is just now nearly finished.

Since the potatoe-oat has become more and more in repute, farmers in general consider it rather hazardous to sow that delicate species earlier than the first or second week of April, even in the most enticing seasons; and this year, considering how much damage it sustained last autumn, besides the very plump quality of the grain, it of course was more advisable to delay sowing to an advanced period, in hopes of escaping that evil to which early sown oats were last year subjected. After all, the oats, on account of the inimical state of the weather, lay unbrairded until the 8th instant, when it all on a sudden changed, and vegetation burst out again, to reanimate the bleak aspect of the leafless plain.

Notwithstanding the long tract of unpropitious weather, wheats, on good soils, have, although late, a very promising appearance; but, as generally happens, on thin wet lands they merit a somewhat different character. On soils of this description, not a little is thrown out; and what remains presents rather a sickly aspect. It was with difficulty that beans were got sown any thing like in season; hence this crop is unusually late. Both the oats and barley brairds look fresh, and they are well planted. Potatoe lands were got well prepared; and, as the progress of the plough has been this year so little arrested, the turnip and fallow breaks may be considered as forward.

Through the quarter, grain of all sorts has found a ready market. So have cattle. Of the former article, generally speaking, little more remains in the hands of the growers than what is requisite for their own supply, during the intermediate space betwixt this and the ensuing crop. From the present high price of provisions, and the great stagnation in trade, it is lamentable to reflect on the situation of hundreds of the poor, who at such a crisis have their whole support, and that of their families, entirely depending upon their daily labour. In this county there is, however, comparatively, less ground for complaint, owing to a small population, most of which are less or more concerned in agricultural pursuits. Many have therefore the necessaries of life within themselves, which our towns' brethren must purchase at the market price, or starve!

The new bridge to be thrown over the North Esk, at Marykirk, is now prosecuting with vigour. This grand fabric, when completed, will greatly facilitate the intercourse betwixt this and the neighbouring county.—19*th May.*

P. S. The weather for two or three days past has been extremely variable, with a good deal of rain; so that the beneficial effects of

the few fine days which we experienced, will speedily be counteracted, unless soon favoured with weather more seasonable.—21*st May.*

Quarterly Report for the Stewartry of Kirkcudbright.

It was stated, in our last, 'that the wind would probably settle 'in the east, and that a course of dry weather might be expected.' This accordingly happened. For about two months from that date, easterly winds prevailed, accompanied with a longer tract of dry weather than had been experienced for eighteen months before. Such, however, has been the inclemency of the season, that we may date the return of spring a month later than ordinary. Even at the first of May, scarce a blade of grass was to be found for the hungry animals. The stock of provisions for cattle was consequently every where exhausted; and many farmers, who had anticipated no scarcity, were reduced to considerable difficulties, and obliged to put both cattle and horses on short allowance. For many years, we have not seen the barn-yards through the district so completely emptied. Had the old practice of overstocking continued, very calamitous consequences must have ensued. The mischief has however been chiefly confined to the sheep stocks; among which the loss of lambs, particularly in the moors and mountains, has been greater than had occurred for a long series of years. Nor is the loss confined to lambs only, many of the aged stock have also fallen victims, or are so much emaciated, that a *fall* (rot) may, it is feared, afterwards ensue. For, in addition to severe frosts in April, always baneful, many of the mountains were covered with snow; and the flocks were thus confined to the lowlands of the farm, already eaten to the bone, at the critical season of lambing, when supplies of fresh pasture are so much wanted. The markets, therefore, are but scantily supplied with butcher meat; and a reduction of the present high prices is not soon to be expected.

This state of the weather, so unpropitious to live stock, has however been highly favourable to all the operations of agriculture. The spring labours have therefore, though late in their commencement, been all brought to a termination at the usual period; and never perhaps were executed in so masterly a style. The dry weather and frosts of April essentially contributed to remedy all the bad effects of the open winter; to prepare fallows; to extirpate weeds; to forward the sowing; and produce the finest mould for the reception of the seed. It was the means, also, of enabling farmers to extend their tillage; to which the high prices of every article of produce afford the strongest inducement. Potatoes in particular, which on a given portion of land, afford the largest quantity of human food, have been cultivated to a greater extent than at any former period. The success of a few farmers, last year, in raising spring wheat, has induced these, and others, to make the experiment this year on a larger scale.

Precisely at the period when all the different kinds of crop were put into the ground, and when farmers, alarmed for a *Beltain* drought, anxiously wished for a change of weather, the *favourable change* took

place, the wind shifted to the west, copious rains ensued, and mild, dropping weather has since continued. Hence crops of every sort have *brairded* well; winter wheat has a very promising appearance; and pasture lands have at length acquired a beautiful verdure.

Thus every thing, so far, augurs well to quiet the alarm of approaching famine. Indeed with regard to this district, there certainly exists no just cause for such alarm. For although the farmers' granaries are perhaps nearly all emptied, and not a stack of grain is to be seen in the barn-yards; yet, it is believed, a sufficient quantity of oat-meal still remains to supply the inhabitants, and even a small surplus for exportation. Such rapid advances in the price of grain as lately took place, have not occurred in the compass of our recollection. Wheat may be stated at 14s.; Barley from 9s. to 9s. 6d; Common and Potatoe Oats from 5s. to 6s. per Winchester bushel; Potatoes at 4s. per cwt.

These high prices have doubtless put some money into the pockets of grain dealers; but (with a few exceptions) have been of no real advantage to the farmers,—whose disposeable produce was mostly bought up before the great advance was surmised. On the other hand, it is presumed, they will be less felt by the lower orders, in this, than in most of the other districts of the kingdom; as the bulk of these had secured their little portions before the alarm of scarcity became prevalent.

We cannot state any variation worth noticing in the price or rent of lands, or in the wages of servants. Both sheep and cattle are sufficiently in demand, and support the former high prices.—1*st June.*

Lanarkshire Quarterly Report.

The long course of mild weather, through much of the months of January, February, and beginning of March, seemed to prognosticate some cold blasts during the remaining part of the spring; and those who expected them have not been disappointed. What remained unexhausted of the stores of winter, began, on the 14th March, to be poured forth in a considerable fall of snow, which, with the frost that followed, suspended field labour every where for about a week, and, in all the higher ranges of this county, during the remaining part of that month. Ploughing was resumed about the 1st of April; and the seed-time, which commenced about the 6th or 8th, was not interrupted till the 25th of that month, when another heavy fall of snow was succeeded by cold showers, and a piercing east wind, which continued till the 10th May. Since that time, the weather (except three days about the 15th), has been such as every person could wish or expect.

Though the ploughing was seldom so much interrupted, the seed-time was just in proper time, and one of the very best. The spring frosts rendered the ground easy to harrow, and the mould deep, though perhaps too small; and the seed seldom got a drier bed. The winter damps have been dried up; and as the frost and snow remained so long, the present good weather may be expected

to continue, and form a sort of Russian summer. The mild showers and genial warmth during May, has already raised grass to the starving flocks, and secured a good crop of ryegrass hay. The wheat never looked better than at present; and the braird, though late, is generally rather too abundant, and looks very healthy.

Owing to the extraordinary scarcity of fodder, want of potatoes, and the lateness of the spring, it was with much difficulty that the cattle were brought to the grass; and they have not, for many years past, come to it in worse habit. Of course, it will be some time before the dairy stock yield much milk, or that of good quality. The last season was, at this time of the year, one of the most propitious to the dairy stock and dairy produce; and this season has till now been every way the reverse. The moor sheep, which had fared so well last year, reached the middle of March in the best possible condition; but they have seldom suffered as much in any season, as they have done from that time till the beginning of May. The snow in March smothered many; and, by keeping the rest in a state of starvation for some weeks, rendered the survivors so lean and weak, that when they dropped their lambs, having no milk, they abandoned their young. Many lambs were lost on that account, and by the severity of the weather. But the moderate rains, and genial warmth of this month, have restored the flocks to vigour.

No season was ever more promising as to fruit. The uninterrupted severe weather in the spring kept back the growth to a period when nothing need be feared from frost; and it has since been soft and mild, not fiery; so that there are great prospects at present of an abundant crop of fruit.

The storm in spring seemed to operate as a signal for the advance of the price of grain; and oat-meal has gradually risen from 1s. 6d. to 2s. 6d. per peck; a price which, in the low state of wages and manufactures, the mechanics cannot well afford. But as it proceeds from the deficiency of last crop, a thing felt over Europe, the good sense of the lower orders will teach them to bear, and not repine, till Heaven send them relief. The riotous proceedings in some of the counties of England, and the want of vigilance in suppressing them, so far from lowering, must have a tendency to raise the price of provisions. Government will, no doubt, encourage the importation of grain, the only effectual relief now to be applied.—*30th May.*

Letter from a Correspondent near Langholm, 26th May.

'The spring quarter commenced most unfavourably to the interests of the agriculturist. A series of dry, cold, and barren weather has almost uniformly prevailed, until the second week of the present month. The seed was put into the ground in pretty good order, from the dry state of the weather; but it was not before the beginning of May that any thing like vegetation appeared, though its progress from that period has been unusually rapid. It has now been ascertained, that the deficiency of last year's crop was greater than at first imagined. A proportion of that crop, greater than usual, having been thrashed off in a wet state in the latter end of harvest,

there now remains very little in the stackyards. The price of every kind of grain has of consequence risen rapidly in the markets; and these prices are likely to be kept up during summer, as there is very little prospect of any supply to be derived from foreign parts. Hay, which at the conclusion of the season was never known to afford a more plentiful crop, is now, owing to the barrenness of the spring months, both scarce and high priced. The cultivation of potatoes, I am happy to remark, is yearly extending in this district; a circumstance highly favourable to the interests of the lower classes, and perhaps no less so to the farmer, as there is constantly a demand for that product in the spring for food or seed; and this root forms an excellent substitute for grain in feeding horses or cattle.

The stocks upon the Highland farms were in excellent condition during the winter months, from the general mildness and openness of the season. A heavy fall of snow about the middle of March, which was succeeded by a long course of cold and barren weather, during which they suffered greatly from want of food, has reduced them very much. The lambing season was not unfavourable, excepting the general complaint of want of food in the pastures. The loss of lambs in high, bleak, and exposed situations, has been very considerable; and a deficiency of that part of farm produce will be generally felt in this district.

The prices of stock sold early in the season, were somewhat higher than those of last year; but there seems at present to be less demand for sheep than there was a month ago, owing, probably, to the scarcity of grass in the pastures. Black cattle, of the country breed, are selling at pretty fair prices; and good horses are still in great demand. Butcher meat is very scarce here, and prices high. There has been nothing done here of late in the wool business.'

East Lothian Quarterly Report.

The months of February and March were very unfavourable for rural operations; so that, though the ploughing was pretty well advanced, it was about the second week of April before any thing of consequence was done in the sowing of spring corn. At that time the weather had set in dry, and continued so till about the 25th, affording a favourable opportunity for depositing the seed in a dry bed; a matter of the utmost importance for the success of the ensuing crop. Accordingly, the far greater proportion of the oats, beans and peas, with a great part of the barley seed, was finished in that month; yet it was not till the month of May that the whole was entirely completed, the business being protracted by several days of raw, cold weather. The same cause also kept back the planting of potatoes to a later period than could have been wished for, although the quantity grown in this district is very limited.

Grass parks have let tolerably well this season, yet for rather less money than they brought last year; which may have been owing to the high price of stock of all descriptions. Throughout the spring months, the wheat continued to look extremely well, notwithstanding the very cold backward weather; but, during last month, the

great and sudden changes in the temperature of the air had the effect of rendering a great many fields very yellow and sickly. Fortunately, however, the mild and genial weather experienced during the two last weeks, has had the happy effect of restoring them to a far more healthy and promising appearance; so that the fields in general, being well planted, although considerably later than frequently happens, a favourable summer may have the desireable effect of producing an abundant harvest. All the spring-sown grain has come well up, and at present shows a sufficiency of healthy plants: the barley, after turnips, is particularly promising, which in very dry seasons is often far from being the case. The grass seeds sown among the fallow wheat and other spring crops, have vegetated regularly, and at present promise well,—a subject of much satisfaction to the farmers in this district, where grass seeds are so extensively cultivated. Pasture grass, though late in rising, from the coldness of the weather, is now excellent everywhere; in few seasons have the fields presented a closer sward, or afforded a fuller bite, for the stock depasturing them. In the gardens, the prospect of fruit is very great; and now, from the advanced period of the season, it is to be hoped that the present flattering appearances will be happily realized.

The first Haddington May fair was held on Friday the 15th, and was well supplied with black cattle; the whole of which were sold readily, at very high prices. The show of horses was but small, and those chiefly of an inferior description: little business, therefore, was done in that article. As the grazing system is becoming more general every year, a public market, at the above period, must be of the greatest advantage to the farmers in this district; affording a ready market for those who may have wintered a greater number of cattle than they have grass for, and also enabling those who have stock to purchase to procure the kind they want, without hunting through a whole district. Accordingly the farmers, with several of the opulent landed proprietors, have signified their intention of giving every support in their power to the measure; and the magistrates of the town, with a liberality that does them much honour, have resolved to exact no custom whatever, until the market becomes fairly established; and even then, it will be a matter of future consideration. At the Dunbar Whitsunday fair, the number of servants was fully equal to the demand; from 5*l.* to 7*l.*, with board, being the common wages for unmarried ploughmen for the half year.

The corn market has risen very considerably during the last quarter; but as the grain is, and has been for some time past, entirely out of the hands of a number of the farmers in this district, any advance in price can be of no advantage to them, while unfortunately they are the class who stand most in need of great prices.

Turnip stock have afforded fair profits throughout the last spring, and the butcher markets have been well supplied; but lately, both fat cattle and sheep have become very scarce, and prices, of course, are

upon the advance. Last Friday, Beef sold readily at 9d., and Mutton at 10d. per lib.——*June* 2.

West-Lothian Quarterly Report.

The last quarter as to weather, from the uncommon fall of snow from the 19th to the 21st of March, and the cold and damp variable easterly winds, during that month and most of April, rendered the land so wet, that it has never wrought kindly, and vegetation was never more backward; which has occasioned the hay and fodder to be mostly consumed. The price of hay is uncommonly high —from 20d. to 2s. per stone, tron weight. But the last week of May has been remarkable for forwarding vegetation; so that the fields for hay have a promising appearance, and the young braird of corn look well; although, in some farms, the grub and wire-worm are doing considerable mischief upon the oat crop after clover lea.

The early sown wheats promise well: but the late have but an unfavourable aspect; indeed, my opinion is, that wheat should never be later sown in this county than the first, or, at the latest, the second week of October.

The markets of every kind are now uncommonly high, as was foreseen from the deficiency of the last crop. The price of butcher meat, too, from the lateness of the season, and the scarcity of keep, has got as high as 9d. to 10d. per lib. Dutch weight, for beef and mutton. The Swedish turnip has proved a valuable crop this season, to those who had a quantity sufficient to store up for the months of April and May.

Wheat sells at from 60s. to 65s., if free of sprouting; Barley, from 48s. to 52s.; Oats, from 38s. to 42s.; Beans and Peas, 40s.— all per boll; (the Wheat and Beans somewhat more than 4 Winchester bushels, the Barley and Oats, 6 bushels to the boll.)

Lean stock, as well as fat cattle and sheep, all bring high prices at this time.

The lands are getting fast forward for the turnip sowing, and a considerable quantity of ruta baga seed is already in the ground. ——*June* 2*d.*

Perthshire Quarterly Report.

It has frequently been observed that, in this climate, the month of March is generally colder than might be expected from the season of the year. This remark was perhaps never more clearly verified, than it has been in 1812. The whole month, particularly towards the latter end, more resembled the depth of a severe winter, than the middle of spring. Rain, sleet and snow, with intense frost at intervals, continued till the 8th of April. From that to the 25th of the same month, the weather was very cold; but, being dry, was on the whole favourable to the oat seed. Till the 8th of May there was not a single day of genial warmth, and then a change took place, which, even in this variable climate, must be considered rather extraordinary. The thermometer, which at 10 in the morning had stood at 46°, rose, in the course of the afternoon to 62°, and next morning stood at 60°. The effect which this change produced on

vegetation, as might naturally be supposed, was very striking. Previous to that, indeed, there had, literally, been no vegetation at all; but since, it has been unusually rapid. Fields, where scarcely a root of grass was to be perceived, were in a few days covered with verdure; and the young wheat, that looked thin and sickly, stocked off, and assumed a healthy appearance. In short, the farmer will soon forget the late spring, and look forward with the animating hope of a plentiful harvest. Complaints are still to be heard in several places of the scarcity of fodder, but these will soon be removed, though it must be acknowledged they have hitherto been too well founded. It is not, however, from such complaints, nor from *feeling* (the most fallacious of all tests), that the above account of the spring is given. The following statement will show the comparative temperatures of the different months.

Average temperature of	January,	at 9 o'clock	evening,		34.0
Ditto	ditto	February	ditto	-	38.4
Ditto	ditto	March	ditto	-	34.6
Ditto	ditto	April	ditto	-	38.0
Ditto	ditto to 26th	May	ditto	-	45.5

The markets, since the date of last report, have been uniformly rising, owing in a great measure to the false alarm of a scarcity. From the limited views of things which mankind in general are apt to take, it was hastily concluded that the loss sustained in the oat crop of last year by shaking, must necessarily produce a famine. The consequence was, to use the words of an intelligent corn-dealer, 'that the man who went to market to purchase three pecks, when he heard others talk of a scarcity, purchased four; and in this way produced the very effects he wished to avoid.' The present market prices here are as follow.

Wheat 60s. to 68s.; Barley 42s. to 48s.; Oats 38s. to 42s.; Oatmeal 2s. 4d. per peck. The price of wheat is to be considered as nominal, there being little in the county but what is in the hands of bakers for home consumption, or of dealers for exportation. The high price of oatmeal presses very hard on the manufacturing and some of the labouring classes of the community, but will not yet compensate the farmer for the low prices of last year;—and as to an absolute scarcity, the idea has originated partly in ignorance, and partly in the wilful misrepresentations of the *pretended friends*, but *real* enemies of civil liberty and *the people*.——*27th May.*

Stirlingshire Quarterly Report.

The crops of grain in this county have turned out very deficient, and were much injured by the bad harvest; and much of the late grain was shaked by the wind. However, our markets continued full, and prices moderate, to the middle of February, perhaps owing to two reasons; first, much of the oats were thrashed out, as they would not keep; and, secondly, rents being now so high, those due at Martinmas and Candlemas took a great proportion of the crop to pay them. The fiars were struck at Stirling about the middle of February. Oatmeal 25s. per boll; Wheat 48s. per boll; Carse

Barley 31s.; Dryfield do. 30s.; Moorland do. 21s.; Peas and Beans 28s. Best Malt 54s.; Second do. 51s. Carse Oats 23s.; Dryfield ditto 22s.; Moorland do. 18s. Since that time, prices have gradually risen, and are now, for the best wheat, 66s. to 68s.; Best Oatmeal per boll of 16 pecks, each peck weighing 18 pounds Dutch, 38s. to 40s.; Best Barley 63s. to 66s.; Best Oats 40s. to 42s.; Best Beans and Peas 45s. to 47s. Potatoes are now very scarce, and sold by retail at 1s. per peck, which weighs about 22 lib. English; but, from the high prices of grain, the greatest part of the farmers in this county reap little benefit, as the greatest part of their crops were gone before the rise. Our chief supply of oats and meal, now, is from the North country, East Lothian, and Berwickshire. However, this county finds less of the scarcity than any county that I know, as every one who is willing to work gets plenty of employment. The war, which has ruined several manufacturing counties in Britain, must have enriched the Carron Company, which is the soul of this end of the county, as they sow money over a great part of it, by paying many colliers, miners, carters, &c. over and above the great sum that is paid weekly at the works; and the town of Stirling, with the several villages round it upon the west end of the county, employ great numbers in the manufacturing of woollen tartans, for which there has been, and still is, a great demand for soldiers' plaids and hose, &c. Upon the whole, the people in this county appear happy; and so they may, when they consider the distresses of labourers in other districts.

From the present appearance of the fields, the high prices of grain must be but temporary. The seed was never better laid into the ground, and the braird looks fresh and very healthy. Potatoes will be the first thing that will introduce plenty, of which valuable root I never knew so many planted as are this year. Upon drilled bean land, that was ploughed in the end of harvest, I began to sow common white wheat upon the 24th February last, and continued sowing, the 25th and 26th. The land was dry; and, being tendered with the frost, harrowed fine. I have for many years experienced, that wheat sown in the end of February, or beginning of March, ripens sooner than when sown upon clover leys or bean stubble about the middle of November or later; and the reasons may be, that, by that time, meat for crows and pigeons being scarce, as soon as the braird points up, they pick it up to get at the root. Another great danger is from snails and other vermin eating the braird; consequently the crop is often thinly planted upon the ground against the spring, which causes it to keep tillering or branching, when it should be shooting; whereas, when sown in the spring, it all comes up; so that, being thick, it has less room to tiller, consequently ripens sooner, and more evenly. Last year I sowed a large field with common white wheat upon the 18th of March, which produced an excellent crop, and the ear was much longer than of that which was sown in the middle of September. We have reason to expect a good crop of every thing this year, except hay; as the seed was never better put into the ground, nor did the ground ever harrow bet-

ter. For although the carses and clay lands were toughened by too much wet in winter, which made it sore for the horses to plough them, the spring frosts dried and tendered them, and made them the easier to harrow; and the cold dry weather caused both men and horses go through their work with spirit; so that all the seed labour in the county is nearly over. How different from last year, when there was much barley to sow after the middle of June!—The cold spring has hurt nothing so much as the grass for hay and pasture, particularly as most of the clover seed that was sown in with barley has forsaken the land; so that the crop of hay depends upon the rye-grass, which is now too far advanced to recover and make a good crop; excepting upon fields that, from want of fodder, were eaten down. When warm weather comes, it will spring anew, and will produce a thicker and better crop than that which is not eaten. Owing to the cold frosts, the ryegrass, in most unsheltered parts, looks unhealthy, and of a yellowish purple colour; so that, come what weather there may, I fear that there will be a light crop of hay. The benefit of hedges and shelter was never more observable than in our carses just now.—Our grass parks have let this year about the same rate as last; and notwithstanding the backwardness of the spring, lean cattle are dear; and it is no wonder that they are so, as there is so much ground laid under grass, which is no doubt owing to the high price of butcher meat. Grass, since 1800, has paid better than grain. Until 1800, beef was never above 6d. per lib. in our market; and since that time, it has gradually risen in price to 9d. and 10d., and it is now 12d.; best Veal, 8d.; Lamb, 12d. per lib. of 22 English ounces; Butter, same weight, 18d. Owing to the sudden stoppage of distilling from grain, fat cattle are now very scarce and dear; and no wonder, considering the great quantity of beef that is used by the Navy, and the wise rule that Government has adopted, in obliging the soldiers in barracks to eat beef, which is much better for them than its value in whiskey.—Yesterday was our May fair, when a greater number of milch cows were shown for sale than usual; but the greatest part were in poor condition, and many not sold, and for the reason that brought them to market, viz. want of grass. Those in condition, that were sold, brought high prices. There were very few stots or cows for feeding in grass parks; but what there were, sold well. There was a poor show of horses, and as poor a demand.—*May 24th.*

Tweeddale Quarterly Report.

In the first and second weeks of March some peas and oats were sown in the lower parts of the county, but to a small extent. About the middle of that month, frost, accompanied with partial showers of snow, put a stop to the labours of the field; and, on the afternoon of the 20th, a severe storm commenced, which continued with unabated fury for several days; completely shut up the roads; and lay in prodigious wreaths on the hills and hollows, into which the violence of the wind had carried it. About the 3d of April a partial thaw commenced, and cleared the fields, which had been swept by the wind; but it was soon succeeded by frost, which not being very intense, the sowing of oats began to be pretty

general on the 6th, on fields that were dry and cleared of snow; and in a few days the ground was in a fine condition for receiving the seed, and harrowed remarkably well, being well pulverized by the frost, though a number of wreaths of snow kept possession of their places, obliging the farmer to leave part of his fields unsown, till, by turning them up repeatedly with the plough to the influence of the sun and air, they were obliged to disappear; and though late, we have seldom seen a better oat-seed time. The weather still continued frosty and barren till the 8th of May, when a favourable change took place, and vegetation began rapidly to burst forth, but was considerably checked by a return of cold east wind on the 16th, which continued for eight days, and was again succeeded by genial warmth, which has now clothed the fields with verdure.—Sown grass looks well, even where it was eat by sheep in the spring, and promises to give an abundant crop, if the season shall continue favourable.—September sown wheat has stood the winter well, and has a promising appearance; but what was sown in November (from the barrenness of the spring) is far behind in growth, and would require a long and good summer to ripen it, with little prospect of an average crop.

Oats and barley have brairded well; but very little of the latter is sown, owing to the mistaken policy of the Legislature, in so often prohibiting it from being brought to the best market. Will this stimulate the farmer to raise more grain? or will it have the contrary effect? More than the usual quantity of ground has been planted with potatoes; from a very proper idea, that though this county is too far from markets for any considerable consumption of so weighty an article, yet they keep very well in pits through the winter; and in spring are very useful to succeed turnips in feeding cattle, and carrying them on for a better market; and as the soil is generally good for raising potatoes, the Mid-Lothian farmers find it their interest to take considerable quantities for seed from it.—Oats, too, succeed better after potatoes than after turnips; and in any season, but especially in a season of scarcity, like the present, they are the first relief to the poor.

As might have been expected from the deficiency of last crop, and the full markets through the winter, prices of grain have risen very high, but with very little advantage to many farmers in this county, and least to those who have most need of it. Some individuals have a few stacks in their yards; but, with the greatest part, both corn and fodder are gone; and some farmers have been very much pinched to get their cattle forward to the grass, which has been impatiently waited for, and now begins to give universal relief.

The poor begin to murmur at the high price of provisions, and they certainly deserve a great deal of sympathy in that respect: But, as is commonly the case with the lower orders, they attribute it not to a scarcity by the will of Providence, but to farmers and dealers keeping up grain, and not bringing it to market; and think that the man does not deserve to live who has a single corn stack

or boll of grain standing beside him: Not considering that it would have been much better for all parties, had the farmers in general been enabled to lay up a part of their crop through the winter, and thereby brought a medium supply to market through the year. But they do not see that the farmer was the first to suffer, both from the deficiency of crop, and from being obliged to thrash out, and dispose of the greatest part of it at a low price, in order to raise money to pay high rents, and other expenses proportionally high. And they as little consider that dealers, who laid up in granaries part of the superfluous supply of the winter markets, were their best friends (instead of their greatest enemies, as they apprehend) as they were only laying out capital in order to keep for them such superfluous supply for a time of scarcity. That this should be done out of pure patriotism, is not to be expected. Suffice it to say, that the effect is the same, though self-interest should have been their sole motive for so doing. Prices have not been so high in this, as in some neighbouring counties. Prices of oatmeal at Peebles, on Tuesday last, were from 35s. to 36s. per boll.

Sheep were in excellent condition at the beginning of March; but seldom have they met with such an adverse spring; a great many lambs have perished: on some high farms more than a third; and the remainder, from cold and hunger, have been so stinted in their growth, that very few of them can be good; but such as are good may be expected to bring good prices. Cast ewes, in the spring, sold at from 10 to 15 per cent. higher than last year: some black-faced as high as 25s. 6d.; Cheviot from 28s. to 30s. Yet, notwithstanding the advance of price, if a better opening is not found for the woollen trade, a number of store farmers will not be able to pay their rents from the produce of their farms.—Fat cattle, I believe, are all disposed of in this county: a few that were kept on till the middle of May sold at 13s. per stone, sinking offals. The demand for lean cattle is also brisk, and prices good, and may be expected to be so for a considerable time, if the season continues favourable, as a great flow of grass may be expected, having been so long shut up by so barren a spring.

Upon the whole, farmers at rack-rent have been considerable losers for these two years past, as produce and prices, taken together, have not been nearly adequate to meet the high rents, and other expenses. And those with small capitals must have been very much distressed; several of whom, in this county, have been obliged to give up their farms.—*June* 1.

ENGLAND.

Cumberland Quarterly Report.

The present appearance of the crops has seldom been surpassed. Wheat, in particular, is uncommonly luxuriant, and no doubt can be entertained of its being above an average crop, provided the ensuing months should be equally favourable with the last. Lent grain of every description has in general been sown; and a very considerable part of the barley, within the last ten or twelve days,

in many parts of the county. Potatoes have been planted during a very excellent season, and there is every prospect of a good crop. Nearly one third more of this valuable root has now been planted, than the inclemency of the season last year permitted at a period considerably more advanced than the present. This was the leading cause of the present scarcity.—Swedish turnips are in general sown, and their culture is annually extending. Turnip fallows are in great forwardness.—There is every cause to expect a good crop, both of grass and corn, this year; and it is to be hoped this prospect will induce the various classes of society to display their thankfulness and gratitude to that Providence who, in the midst of the most severe judgments, as every well regulated mind must be convinced, invariably remembers mercy. At a moment when riots are so frequent, in a county distinguished for its former tranquillity, it is the duty and interest of the higher ranks of society to manifest their benevolence, by expending part of their property to supply the wants of the labouring poor, the pressure of which, in consequence of the failure of our manufactories, has been severely felt. During the last month plans with this intention have been formed, and, except in one instance, no tumultuous meeting has taken place either at Whitehaven, Workington or Maryport. It may be justly doubted whether the proprietors of the collieries, in the west part of this county, selected the best period for the advancement of the price of their coals; since, in consequence of such an attempt, many colliers were prevented from supporting their families with their usual comfort. It is distressing to think that the captains of vessels should have been compelled, in a nation possessing so much liberty, to pay the demands of one of our coal proprietors, in consequence of menaces openly made by his colliers, that if the captains did not purchase at the advanced prices, they would destroy either their ships or houses.—The riots in the neighbourhood of Carlisle and Wigton have been frequent, and required the interference of the military. If the labouring classes reflected for a moment, they must be convinced that the modes they generally take to supply themselves by improper means, are only calculated to produce the very scarcity they are so much afraid of. In one instance, they burnt three stacks: thus destroying, either wantonly or maliciously, the very provisions they wanted. These mobs commenced in consequence of very extensive exportations of grain from Cumberland, which had continued since November.—The quantity of grain, &c. exported from this county is estimated to amount to more than 100,000*l.*

Mr Curwen's wheat on clover lea promises to be better than was once expected. Nearly fifty acres have been resown. The causes of his failures have been, the climate, and want of seed, combined with the lateness of the season when sown. His wheat, after fallow and potatoes, is good. He is resolved to abandon a system which has not yet answered, and to substitute the following—1st, Fallow or green crop; 2d, Wheat; 3d, Green crop; 4th, Wheat; 5th, Clover; 6th, Grass depastured by sheep; 7th, Wheat. This will en-

able Mr Curwen to sow earlier; and the crop is not so likely to be injured by the coldness or humidity of the climate.—Mr Curwen's clovers are very good; and during the three or four last years have almost never failed. A close attention to the pulverization of his soil, harrowing his wheat, the use of the drill, and the allowance of a sufficient quantity of clover-seed, are the chief causes of his success in this crop. He never depastures his clover stubbles during winter—one leading cause of the deficient crops of clover in this county. That his exertions have been useful to this county, cannot he doubted. It is to be hoped he will not resolve to continue, for his own interest and the benefit of the country, any rotation which he finds not well adapted either to his soil or climate. With his capital, his spirit, and his extensive observation, he may in time establish a system of management calculated to add to the riches, both of the nation, landed proprietor, and farmer. His past failures must have been beheld by every friend of agriculture with concern; and Envy alone can delight in his want of success.

Wheat 15*s.*; Oats 6*s.*; Barley 10*s.* 6*d.* Winch. Servants, as usual, 12 guineas, 13 guineas, and 15*l.* per half year. Potatoes 7*d.* to 8*d.* per stone.——*May* 29.

Northumberland Quarterly Report.

The weather, through the months of January and February, was very changeable, being alternately frosty and fresh, of few days continuance, which prevented the sowing of wheat, until the 20th of February; from this period, to the end of the month, most of the lands that were cleared of turnips were got sown. From the beginning to the end of March, the weather being mostly frosty with snow, prevented any more wheat being sown, and was so very unfavourable, that no other kind of grain could be got sown before the first week in April. Through the whole of this month, we had almost uninterrupted fair, frosty, dry weather; and of course, the oats, and other spring grain, were put in under very favourable circumstances: the land, being pulverized by the previous frosts, harrowed with great ease and expedition. Through the whole of this month, and the first week of May, the wind was mostly from the north and north-east, and intensely cold and inimical to all vegetation. On the 8th of May, the wind got to the southward, and the succeeding ten days were mild and warm; but, on the 18th, the wind got northerly and cold, accompanied with rain; and, on the whole, there probably was never remembered a more backward spring: as an instance, the black thorn was only beginning to open its blossoms, on the 17th of May. From the above circumstances, the pastures were probably never known later in growing, there being scarcely a pile of grass, or a leaf of clover, at the beginning of May.—The autumn-sown wheats are well stocked with plants, which are clinging to the ground, and have the appearance of tillering well; but those sown in the spring are looking thin, weak, and very backward, owing to the inclemency of the weather through March and April. Turnips were last year an abundant crop; and in the beginning of February, it was thought they could not be consumed; but before

May, many persons who wanted to sell at the commencement of winter, had to become purchasers; and many others, who expected they had an ample sufficiency, run short by the middle of April; and, there being none to be purchased, they were under the necessity of selling their fat stock before the time they intended. The lambing season, for the Cheviot flocks, was rendered exceedingly unfavourable, by the mountainous district being covered with snow, the first week in May; and the ewes, (from a want of grass) not having a sufficiency of milk, numbers of lambs died for want of that necessary nourishment. The markets for live stock of all kinds, have been very good. Beef, from 8s. to 8s. 6d. per stone (of 14 lib.) sink; and at Alnwick fair, on the 12th of May, 9s. was given; Mutton, from 8d. to 9d. per lib. sink. The prices for corn are uncommonly high, the best Wheat being from 15s. to 16s. per bushel, Winchester; Barley, 10s. and Oats from 6s. 6d. to 6s. 9d. The stack-yards have little remaining in them, in comparison with what they generally have at this season.—*24th May.*

P. S.—At present, I am in Yorkshire, near Richmond, where oats are 8s. per bushel. The autumn-sown wheats, both here, and in the county of Durham, are looking well; but those sown in spring will be very defective crops. In this district, there is scarcely a stack of corn to be seen; but the farms are all small, and the tenants, in general, poor, which is mostly the case where small farms prevail.

Letter from Wales, May 22.

After I wrote you last, we had a long continuance of wet weather, which kept back the seed process; it was near the end of March, before we could go on to do any good, either with beans, peas, or oats; of course, all the spring corn is late; and the sowing of barley, with some, is hardly finished. Many are still planting potatoes, of which there seems to be a greater quantity than usual in this part. We often run from one extreme to the other; and, if we have a favourable season, that article, though at present selling very high, may, after harvest, hardly pay the expense of carrying to market. During the month of April, and great part of this month, we had dry cold winds, and, though favourable for sowing, vegetation was kept back, and we had but little grass till within these few days; since when, the weather has been mild, with heavy thunder showers, which has caused a sudden change on the face of the country; and things at present have a good appearance. The growing Wheats seem very promising, but at this time last year they were so too; and yet we hardly recollect so bad a crop at harvest. The spring corn looks also healthy. Some are beginning to sow the Swedish turnips, and others preparing for the other kinds. Grain, of all kinds, has advanced during this quarter. Good Wheat, 50s. and 52s. for 168 pounds, or, if measured, for 21 gallons; Barley, 30s. and 32s. for 21 gallons; Oats, very few to be got, and sell at 3l. or 3 guineas the quarter, Winchester. Cattle of all kinds maintain last year's prices, as do fat sheep; but store sheep, and ewes and lambs, are lower. Good horses sell well, but pigs are slow. If we have a late harvest,

corn must be very short, as there seems little in this part unthrashed. There has been a great proportion of early potatoes planted, which now look well; and we are in hopes they will be a great assistance before the corn comes.

NOTICES TO CORRESPONDENTS.

The Memoir of the late DUKE of BUCCLEUCH, intended for this Number, is necessarily postponed: We much regret the circumstance.

The remainder of '*Mr Aiton's* Remarks on the Dairy' did not reach us in time for insertion, but shall be given in next Number. The same observation is applicable to several other communications.

Our intelligent Friend's remarks upon 'Mr *Hunter* of *Tynefield's* system of farming,' an account of which is inserted in SIR JOHN SINCLAIR'S Treatise on Scotish Husbandry, shall be duly attended to; but the sheets were nearly all thrown off before it was received.

As SIR JOHN'S Treatise is of more than usual importance, and embraces a great variety of subjects the most interesting to agriculturists, it was thought that those farmers who have not yet seen it, would feel gratified in the mean time by a general knowledge of its contents. On this account the present Number is extended much beyond the usual limits. We mention this circumstance for no other reason, than as an apology for abridging some papers, though not without the permission of the writers. We allude particularly to some incidental remarks on Distillation; and as, on this subject, the sentiments of our Correspondents are directly opposite, it will give us pleasure to have the arguments on both sides transmitted at their earliest convenience.

Our correspondents are respectfully requested to forward such communications for the 1st and 2d Branches as they wish to have inserted in the first Number thereafter, at least *six weeks* previous to the day of publication; and we beg our Reporters, in particular, to transmit their much esteemed accounts of Rural Affairs, *ten days* before the date of each subsequent Number. Unless this be attended to, we must often have to regret that the early insertion of any paper even of only a few pages, must be impracticable. It is much wished to keep the day of publication invariably; on which account it is always announced at the end of the Number immediately preceding.

No. LI. *will be published on Monday the 17th day of August.*

ERRATA.

Page 151, line 19th from top, for 'in the neighbourhood,' read 'in his own neighbourhood.'

Page 216, line 10th from the foot, for 'laſt,' read 'ſecond;' and in the following line, for 'intervening,' read 'ſubſequent.'

D. WILLISON, PRINTER, EDINBURGH.